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ABSTRACT

Materials contained in this Massachusetts curriculum guide are based on concepts and procedures developed by the Highway Users Federation for Safety and Mobility. The guide examines the philosophy of driver education, discusses such legal aspects as certification of students and teachers, presents a comprehensive classroom and behind-the-wheel syllabus, and enumerates resource materials. The first section of the guide, organization and administration, discusses roles and responsibilities of professionals involved; general objectives, courses, scheduling, and evaluation of the program; the vehicle; public secondary school teacher certification requirements and procedures; student certification; Registry of Motor Vehicles policies and procedures; and accident procedures. The second section contains the instructional program. The curriculum format details the part, unit, episode, episode principle and purpose, concepts, supporting principles, behavioral objectives, learning activities, and evaluation. Major parts of the curriculum guide deal with orientation tasks, on-highway tasks, readiness tasks, and improvement tasks. The appendix contains lesson plans, suggested forms, bibliography, sources of instructional materials, and an evaluation sheet for the guide. (TA)

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DRIVER AND TRAFFIC SAFETY EDUCATION CURRICULUM GUIDE

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF EDUCATION

DIVISION OF CURRICULUM AND INSTRUCTION
BUREAU OF ELEMENTARY AND SECONDARY EDUCATION

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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COMMISSIONER'S MESSAGE

In this era of expanding communications, one can hardly ignore the proliferation of highways, automobiles, drivers, or accidents. Simply because accidents are usually newsworthy, and because young people are frequently involved, it is apparent that adequate driver training must be provided by the schools. It would be naive to suppose improved roads and sophisticated automobiles will eliminate or alleviate the danger, for the human integer will remain fallible in spite of technological progress and systematization. Nonetheless, the quality of the drivers should be commensurate with that of the equipment. Since assembly line procedures are not desirable educationally, we must adopt other methods of making our students proficient and responsible drivers. This Guide, providing curricular directives that can be adapted to the needs of each school, is a beginning. You as educators and citizens are urged to use it well.

The enthusiastic dedication of individuals, groups, and agencies to this project deserves to be recognized; thus, appreciation is extended to all involved for their assistance. Their cooperative efforts should produce better Massachusetts drivers.

Neil V. Sullivan
Commissioner of Education

REGISTRAR'S MESSAGE

I am happy to be identified with the Department of Education in sponsoring the Massachusetts Driver and Traffic Safety Education Guide. To all those who worked on the planning and execution of this publication, my hearty thanks.

Driver education does not guarantee an accident free future but offers the best available knowledge to cope with the driving syndrome, affording the best chance for survival in this propulsion conscious society.

Some monies spent on regulating and controlling errant drivers might better be allotted to the preparation and education of people during their impressionable years.

The actions of our driving citizens directly affect all of us, and driver education is a giant stride toward improving our lot. Its support and expansion deserves our unified attention, and toward that end this guide is dedicated.

David J. Lucey
Registrar of Motor Vehicles

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INTRODUCTION

The Massachusetts Driver and Traffic Safety Education Curriculum Guide is the result of requests from many driver education teachers, curricula developers, and school administrators. Since public safety is of prime concern, since public transportation in 20th century America hinges upon the automobile, and since thousands of new young drivers are licensed every year in Massachusetts, it is to our obvious advantage to provide effective instruction in the schools. Schools must serve the needs, interests, and abilities of youth, thereby directly benefitting and shaping society. The vital need for driver and traffic safety education has initiated this Guide; the concerted efforts of educators in employing it should produce drivers whose skills and attitudes will improve the quality of our lives by making highways safer.

With the Instructional Program based upon concepts and procedures developed by the Highway Users Federation for Safety and Mobility, the Guide examines the philosophy of driver education, discusses such legal aspects as certification of students and teachers, presents a comprehensive classroom and behind-the-wheel syllabus, and enumerates resource materials. Although not a textbook, the Guide provides criteria for content and objectives, considers traffic and transportation generally, and should stimulate thought about future transportational development. For all those actively involved in driver education, it will provide a foundation; for others more peripherally interested, an embellishment. In any case, it is intended to enrich the curriculum and to expand and delineate instructional boundaries.

Driver and traffic safety education can be more fully integrated into the school's curriculum. Only half the job is accomplished by teaching driving skills, for while learning skills is not difficult for the average teen-ager, his attitude and social behavior often cause trouble. Thus to teach techniques alone when educating young drivers, abandoning the vital task of attitude formation, is spinning one's wheels. An educational program for grades K through 12 with units developing positive attitudes towards and concern for safety is needed. Such topics as pedestrian, bicycle, and passenger safety could be included. Organized with teachers of driver education whose lectures and demonstrations would be nuclear, ideally, the program could begin to establish and nurture concern for safety in the minds of elementary students. High school students with this background are probably more likely to observe the tenets of safe driving; they are certainly more aware of and receptive to them.

Educating the driver to manipulate a complex machine safely and efficiently in an increasingly complex society is a task that will benefit from continuing research and innovation. Your ideas and comments, forwarded to the Department of Education on the evaluative sheet at the back of the Guide, will provide invaluable resource information. Since driver training must be included in the formal education of the pupil to satisfy social and personal needs, ideally the program should encourage him to perceive himself and others more realistically and to accept responsibility for his actions, thus reducing accidents. The Guide will open the highway; each school will provide a vehicle and map; but the operational burden rests with the student. Let us direct him as skillfully as we can.

ORGANIZATION AND ADMINISTRATION

ROLES AND RESPONSIBILITIES

The professional team approach is essential if this publication is to be an effective addition to the curriculum. Each of the following individuals has a specific function; yet each must complement the activities of the other to produce a vital driver education program.

Commissioner of Education and Registrar of Motor Vehicles

The General Laws Chapter 71, Section 13D, as amended by Chapter III, July 4, 1967 state, "Motor vehicle driving education may be incorporated as a phase of the safety education program in high schools of the commonwealth. The content of driver education courses shall be established by the commissioner of education in collaboration with the registrar of motor vehicles. . . . "

State Driver Education Supervisors

Supervisors of driver education should perform the following functions:

1. Encourage, stimulate, and supervise courses to prepare teachers for driver education.
2. Supervise the training of new drivers.
3. Act as liaison officers between the Department of Education and the Registry of Motor Vehicles in establishing safety standards and procedures.
4. Develop and improve curricula in driver education.
5. Attend and participate in educational and other meetings concerned with driver education.
6. Visit colleges and schools engaged in driver education programs.
7. Assist in conducting research studies, surveys, and reports.
8. Provide field services for establishing new driver education courses.
9. Supervise and assist existing driver education programs.
10. Work closely with public groups supporting driver education.
11. Stimulate and provide in-service educational programs for teachers.
12. Encourage local schools to engage in adult and extracurricular youth driver education programs.
13. Work closely with the federal government and other states.
14. Work closely with other disciplines within the Department of Education.
15. Work closely with other state agencies.

Superintendent of Schools

The superintendent of schools must understand the standards of the driver education program stated in this administrative guide to assist him in hiring professionals. He must make sure the instructor he selects is fully certified. Since the impact of driver education on the student's future and the public relations value of this program are vitally important, the teacher must be adequately prepared and emotionally able to accept the responsibility of teaching behind-the-wheel. The superintendent must thoroughly investigate the prospect's teaching and driving record, which must be good, before hiring him.

The superintendent is also responsible for providing these facilities and materials:

1. Textbook and additional study and reference aids. (See Appendix.)
2. A well equipped classroom and laboratory providing opportunity for the instructor to enrich the program. Classroom equipment would include:
    a. Magnetic traffic boards
    b. Vehicle parts
    c. Driving simulators
    d. 16 mm film projector
    e. Overhead projector
    f. Filmstrip projector
3. Testing devices for discovering limitations in vision, hearing, and physical reactions so the student can realize his deficiencies and compensate for them. Incidentally, such testing devices can often be employed in the athletic and health program.
4. A suitably equipped and insured automobile. The vehicle must be properly maintained for the protection of all concerned.

The superintendent should encourage the instructor to attend and participate in regular in-service clinics in order to improve and update his teaching methods, and to participate in local safety programs so the entire community can benefit from his knowledge. Participation in national and state traffic safety meetings should broaden the instructor's outlook and improve his performance in driver and traffic safety education.

Secondary School Principal

Scheduling the program of driver and traffic safety education to meet standards for Massachusetts public schools is the principal's responsibility. Many methods of scheduling the classroom phase of driver education exist, the most common of which are described in the section on scheduling.

Students enrolled in an approved course must receive a minimum of thirty (30) clock hours of classroom instruction and twelve (12) clock hours of on-the-road training (6 behind-the-wheel and 6 observing another student driver in a motor vehicle). Each school will adjust time allotments according to the length of the class periods.

The minimum time indicated is mandatory to qualify for a driver education certificate. When additional time is needed to present a subject well, the extra time should be added to the total and not subtracted from the time allotted to another subject. The same norm determining rank in other subject areas is appropriate to driver education.

Driver Education Instructor

The instructor must be certified by the Department of Education and the Registry of Motor Vehicles. He must keep his instructional content and materials up-to-date and his methods and techniques of teaching consistent with those currently accepted in the profession. He must provide the administrator with information needed to acquire dual control vehicles, insurance coverage, testing equipment, textbooks, and teaching aids. He should suggest new techniques of instruction and scheduling of classroom and on-the-road phases of the program through reading, conferences, and in-service courses. He also has a responsibility to keep his administrator informed on phases of the program such as instruction, materials and supplies, equipment, public relations, and rules and regulations of the Massachusetts Department of Education and the Registry of Motor Vehicles.

Every teacher of driver education must have a card identifying him as a secondary school teacher certified by the Board of Education and qualified for fitness and ability to give instruction in driving by the Registry of Motor Vehicles. This card can be obtained from the Supervisor of Driver Education, Registry of Motor Vehicles, 100 Nashua Street, Boston, Massachusetts 02114 by:

1. Submitting an application. A form is available on request.
2. Submitting a Board of Education secondary school teaching certificate. Originals will be returned.
3. Submitting a certificate or transcript from a basic college course in driver education with three (3) semester hours credit. Originals will be returned. If at least six (6) hours of practice teaching in the motor vehicle has not been part of the basic course, the applicant must submit a certificate for same from a certified driver education teacher.

Since the Department of Education is not responsible for issuing licenses, a license cannot strictly be considered an end of the course. The Registry of Motor Vehicles licenses individuals according to its own policies, and while the approved course will prepare the student for driving, it cannot guarantee him a Massachusetts license.

Conducted outside the school grounds and in direct view of the public, the on-the-road phase is one of the few aspects of public education constantly observed by the taxpayer. Thus the instructor should be highly qualified not only in his profession but also in public relations. He can actively inform the public about the driver education program by:

1. Being available to interpret the program to community groups.
2. Providing effective communications, both written and verbal, for parents of students.

3. Arranging exhibits and demonstrations.
4. Developing "open house" activities, especially during American Education Week, and arranging for parents and citizens to:
    a. Participate in classroom activities
    b. Take psychophysical tests and hear the teacher interpret the results in terms of teaching
    c. Evaluate their own driving skills in simple uncomplicated situations
    d. Measure their own knowledge of safe driving practices, rules of the road, and traffic laws in brief tests to be scored privately
5. Modeling a good example and insuring that students do the same.

Since this course is part of the school's comprehensive educational program, community support consistent with the school's public relations policies should be sought and channeled through recognized school authorities. Final approval of and responsibility for such efforts rest with the administration. If public relations are handled this way and supplemented with locally conceived and effectively implemented elements, any problems with facilities, space, equipment, and time allotment should be resolved. Such groups as police departments, highway patrols, insurance organizations, traffic courts, driver licensing authorities, automobile clubs, public safety departments, safety councils, automobile dealers, women's groups, and fraternal organizations recognize the value of public school driver and traffic safety educational programs. These groups can contribute tangibly to the program by providing instructional material and equipment, consultant and resource personnel, and pertinent information. Their interest is a distinct advantage to the school and should be encouraged by earnest public relations policies.

A lay advisory committee of parents, students, and teachers is recommended as an effective means of strengthening support for driver and traffic safety education. Appointed by the local school committee, the members should study the program and report their recommendations back to the board. Members should attend and participate in professional meetings to increase their understanding of the overall program. The group should also be encouraged to communicate its findings to the entire community in a manner consistent with the school's public relations program.

General Objectives

A good program in driver education must:

1. Develop desirable attitudes in student drivers by encouraging them to recognize and accept their personal, social, moral, and legal responsibilities.
2. Promote safe, efficient, and enjoyable use of motor cars and highways by developing an understanding of their construction, maintenance, and function.
3. Develop skills required to operate motor vehicles properly and safely.
4. Develop an understanding of physical, emotional, and mental variables affecting the operation of automobiles.

Courses

Beginning School Age Youths Driver and traffic safety education to meet standards for an approved course for Massachusetts public schools consists of two phases, classroom and on-the-road (laboratory). The class instruction phase must meet the standards of excellence necessary for safe living in this motor vehicle age. The minimum time requirement is thirty (30) clock hours of classroom instruction. Every effort, however, should be made to exceed the minimum. No student should receive more than two (2) clock hours of classroom instruction at one session or attend more than one session per day.

On-the-road instruction for each student who has a learner's permit must include six (6) clock hours of behind-the-wheel instruction and six (6) clock hours of in-the-car observation, discussion, note-taking, and checking. This does not imply that only two students should be in the car at a time. Some instructors take three and four at a time. Every contact a student can have with an instructor in this controlled situation will profit him. Additional on-the-road training should be given to a student who needs more than the minimum of six (6) clock hours. No student should be in a driver training vehicle more than two (2) clock hours per day. The student should drive for one hour and observe another driver for the other.

Beginning Adults The beginning adult should be offered a course similar to that provided for the beginning school age youth, consisting of both classroom and on-the-road instruction. The classroom phase should consist of a minimum of fifteen (15) clock hours of instruction. The instructor should determine the areas of instruction to be emphasized, basing his decisions on the age and other characteristics of his students. No student shall receive more than two (2) clock hours of classroom instruction in one day.

On-the-road instruction should conform to that offered the beginning school age youth with a minimum of six (6) clock hours of behind-the-wheel instruction. No observation should be required, and training should be limited to two (2) clock hours a day.

Refresher Courses for Licensed Drivers The licensed driver who desires retraining may undergo at least a two- and possibly a three-phase program, consisting of evaluation, behind-the-wheel, and classroom instruction. Evaluation of behind-the-wheel performance initially will define the problems and degree of difficulty experienced by the driver. When considered necessary, appropriate tests should be administered to help determine the subject's general driving knowledge, his knowledge of the road laws, and his psychophysical condition. Behind-the-wheel instruction should be continued until the driver can perform properly and consistently. Classroom instruction should be made available to instill knowledge and to assist in developing proper behavioral tendencies.

Scheduling

Class Although the classroom phase is valuable by itself, the best driver education program should include both classroom and on-the-road phases. On-the-road training should be given to students who have already had or are taking classroom instruction. Since the school has an obligation to both students and parents to provide driver education courses for all regularly enrolled students when they become of licensing age, both classroom and on-the-road phases should be offered in the high school curriculum, preferably for one semester. The classroom phase of driver and traffic safety education should not be taught in conjunction with other disciplines such as social studies, industrial arts, or health and safety. It should form a separate course.

Although a class in driver education can be variously scheduled, some minimum standards for setting up a schedule are recommended. Since the length of the class period varies with the school, the following table shows the number of sessions needed to meet the minimum recommended time requirements when the class periods vary from 40 to 60 minutes.

Class Period — Minutes	*Number of Sessions*
40	45
45	40
50	36
55	33
60	30

Classroom instruction should encourage maximum participation and discussion from the student. Learning to drive is generally eagerly anticipated by the adolescent, but he is not necessarily prepared to accept the concomitant responsibility. Classes, therefore, should be limited in size to promote student participation and closer teacher-student relationships. The recommended scheduling procedure would involve twenty-five (25) students in a class conducted during the normal school day when possible.

Laboratory The twelve (12) clock hours of on-the-road instruction for driver education combine skill development and attitude formation with acquisition of the specific facts. Laboratory instruction may be scheduled during a semester, during the regular school day (preferred), before or after school hours, in summer school programs, or concurrently with class or other laboratory phases.

Evaluation

Evaluation in driver education must accord with the times. The annual increase in the number of automobiles creates new driving hazards and problems requiring new knowledge, skills, and more positive attitudes toward the privilege and responsibility of operating a motor vehicle. Schools will have to decide which specific evaluative criteria are most appropriate for their programs. Whatever process of evaluation is employed, the quality of the program and the degree of success or failure of participating students must be assessed.

Evaluation essentially is the process of determining the success or value of a person's performance. The school should consider at least two basic categories: (1) evaluation of the driver education activity itself involving goals, procedures, materials, and learning experiences; and (2) evaluation of the student's progress and achievement during and at the conclusion of the program.

Evaluation should be both a means to determine the success of the course and a learning experience for student, instructor, and program director. Evaluation assists the student in beneficially altering his approach to the learning process. He becomes involved in self-analysis and adjustment which will tend to increase motivation. Results of evaluation may assist the instructors and program directors in comparing their program with others; especially if the evaluative findings for many programs are made available through the Massachusetts Department of Education.

Evaluative methods and tools should be based upon clearly defined objectives. Minimum levels of achievement in knowledge, attitude, and skill must be established and appropriately weighted. The validity and reliability of methods and tools for evaluating each level must be established to justify the weight given each area in the composite grade. The majority of driver education specialists agree that the attitude toward driving is most important and almost impossible to measure. Innovative modes of measuring attitude must be established before appropriate weight can be assigned to this aspect of evaluation. Long term evaluation of the effectiveness of the course should be undertaken throughout the Commonwealth. The new Accident Record Keeping System at the Registry may provide accurate information on the amount of property damage and the number of lives lost as a result of vehicular accidents. Effective programs should reduce both damage and deaths.

The traditional letter grading system interferes with teacher-student interaction conducive to attitude and behavior change. Value judgments in the form of threatening grades act like static in broadcasting. They produce extraneous data that distract teacher and learner from the important objectives of learning. Many students become more concerned with figuring out what the teacher wants and values than with any attempt at independent and original thinking. Fortunately, a trend toward modifying the present system to reduce its negative effect exists. Stating learning objectives in specific behavioral terms presupposes more effective evaluation. Because students are informed of the behavior expected of them, they will no longer have to "psych out" the teacher's values. Well defined, easily apparent objectives for each learning episode serve to promote the learning process and simplify evaluation.

Behavioral objectives not only describe expected student behavior, but also demand a minimum level of performance. Teachers are responsible for insuring that each student who is capable of doing so achieves this level. If a student understands only 50% or 75% of the material, the lesson has been unsatisfactory, especially when safety is involved, and should be repeated. Having to evaluate a given student two, three, four, or more times is a small forfeit in view of the end.

A distinction exists between norm-referenced and criterion-referenced measures. Norm-referenced measures are made by obtaining a distribution of scores from a tested group. The scores express the extent of individual differences, and students compete against each other for high scores. A criterion-referenced measure does not focus on comparing students with each other but rather on comparing students with a fixed external standard of performance. This measure, as does the other, determines the extent to which each learner has achieved the performance objectives and is recommended in driver education.

With criterion-referenced measures, teachers find out if the student can meet the minimum level of performance established for that particular concept, principle, topic, or skill. In the case of failure on written test items, the relearning process may require only a brief explanation or reminder by the teacher to correct the deficiency. In other instances, additional study, practice, or tutoring may be required before the student finally achieves the standard.

If all students are expected to achieve a minimum level of performance on planned objectives, the criteria for letter grades will be slightly different. Although each student must meet a minimum performance standard in basic driving tasks and functions (ability to identify, predict, decide, and act in various traffic situations), some students will exceed that standard by a significant margin. This high level of achievement can be recognized by a higher grade. Other criteria, not directly related to driving task performance, available for grading purposes are:

1. Promptness in submitting, in acceptable form, written or other assignments.
2. Initiative in finding and using supplementary materials.
3. Respect for the ideas and values of fellow students.
4. Conformance to the ground rules for the classroom and laboratory phases of the course.
5. Ability to ask pertinent questions.
6. Use of accurate thinking habits.
7. Originality in carrying out special projects.
8. Effort, improvement, and achievement according to potential.

To evaluate objectively traits like promptness, initiative, respect, conformance, and effort, the teacher needs to keep anecdotal records of student behavior. These will furnish evidence to support his value judgements. Although these traits are not essential for driving a motor vehicle, they facilitate class management and the learning process. They allow the student to acquire more effectively the concepts, skills, and values to help him become a competent driver.

Procurement of Dual Control Cars

One method of obtaining a suitable automobile is to use money allocated by the school district to purchase one from a local car dealer. Often service clubs donate a driver education automobile to the school district, or automotive companies loan one without charge as a service to the school system. An automobile can be rented or leased through a dealer for one school year; moreover, all expenses may be taken care of by the dealer, unburdening the annual school district budget. This particular program is becoming more popular in many states today. Any person interested in obtaining cars should contact the Department of Education or the Registry of Motor Vehicles.

Driver Education Signs

Signs identifying the training car should be visible from both front and rear. The sides and top may be used for identification. Information about placing signs should be obtained from the Registry of Motor Vehicles to insure uniformity. When a car is on loan, the courtesy identification should be no more than a single line. The letters should not be more than one half the size of those stating the name of the school.

Instruction and Safety Equipment

Statuatory equipment consists of:

1. Dual brake
2. Dual clutch (if manual shift is used)
3. Seat belts for front seat

Additional recommended equipment consists of:

1. Dual accelerator
2. Decelerator
3. Inside mirrors (one for student and one for instructor)
4. Two side rearview mirors
5. Dual ignition switch (used when changing drivers or when talking to students at the side of the road)
6. Dual horn
7. Seat belt for each occupant (harness belts for the front)
8. First aid kit (checked often by instructor)
9. Fire extinguishers
10. Cushions and pedal extensions (smaller students may need these aids)

11. Tire-changing equipment (jack, spare tire, lug wrench)
12. Clipboard (to be used as chalkboard)
13. Brake reaction detonator (to test brake reaction time of students)
14. Measuring tape (to measure skid marks)
15. Signs (Caution-Practice Area, Reserved for Driver Training)
16. Emergency warning equipment
17. Under dash light

Insurance

Local boards of education should have an insurance plan to protect themselves as well as the teachers and students. Legal counsel should advise the coverage necessary to protect all those who might become involved and determine the limits needed. The on-the-road instructor should add a broad form coverage clause for driving other cars to his own automobile liability policy. He could also have his name added to the driver education automobile policy.

Maintenance

The driver education automobile should be periodically maintained by the instructor. A schedule of oil changes, lubrication, tire check, and washing should be established and posted for each vehicle.

A daily check of the exterior as well as the interior of the automobile for dents, scratches, and the like is advisable. A garage to house the driver education automobiles should be provided. All reapirs should be carried out immediately in the best interest of safety and public relations.

PUBLIC SECONDARY SCHOOL TEACHER CERTIFICATION REQUIREMENTS AND PROCEDURES

I. Step 1 — Department of Education

- A. A bachelor's degree
- B. Twelve (12) semester hours in education courses approved for the preparation of teachers of driver education
  1. Not less than two (2) semester hours in supervised student teaching at the appropriate grade level
  2. The remaining semester hours including two or more of the following areas:
     - a. Philosophy of education
     - b. Curriculum development in the special subject field — driver education
     - c. Methods and materials of teaching driver education
     - d. Educational psychology including child or adolescent growth and development or both
- C. A minimum of eighteen (18) semester hours of preparation at the college level in the special subject — driver education

The above requirements are minimal. It is strongly recommended that each driver education teacher continually upgrade his background and knowledge of driver, traffic, and safety education. Individual problems in teaching driver and safety education, new and advanced equipment, evaluation practices, and accident causation and prevention are not fully covered in basic driver education. Because knowledge is continually expanding, each teacher is strongly urged to complete an additional course in driver education or a related field every three or four years.

In order to assist the certifying office of the Department of Education in determining if the candidate has eighteen (18) semester hours of preparation at the college level in the special subject, the candidate's transcript must show at least three hours in an approved course in driver education. The remaining fifteen (15) semester hours credit may have been earned in at least two of the following areas: physics, mechanical engineering, safety education and first aid, general psychology, guidance, sociology, statistics, audio-visual aids, law, and advanced driver education. Any certified teacher who has not given actual behind-the-wheel instruction within a five (5) year period should be required to perform six (6) hours of practice teaching under a practicing certified instructor.

II. Step 2 — Registry of Motor Vehicles

- A. Public Schools
  1. Must have valid Massachusetts license.
  2. Application for certification on file.

3. Board of education teaching certificate (secondary school).
    a. Any person who taught in a Massachusetts public school prior to July 26, 1951 and can furnish documentary proof is exempt from the provisions of the certification act and, if he has taken #4 below (Basic Driver Education), may be employed to teach driver education in the public schools of Massachusetts.
    b. Any person holding a Massachusetts certificate from #1 to #18444 (general certificate) and has taken #4 below (Basic Driver Education) may be employed to teach driver education in the public schools of Massachusetts.
    c. Inasmuch as a teacher in a state aided vocational school requires teacher certification under Chapter 71, Section 38G only if the employing authority requires it, a teacher of driver education employed teaching same in a state aided vocational school would require a teaching certificate under Chapter 71, Section 38G only if the employing authority required it. The teacher must have taken #4 below (Basic Driver Education).

    Persons not holding vocational certificates must submit a letter from the head of the school stating that he or she is a member of the faculty. (Person will be restricted to that particular school.)

4. Basic driver education course certificate or transcript (college level — three (3) semester hours credit).

NOTE: Temporary certificate for one school year expires June 30 (not renewable) because of hardship — meets all requirements except #4.

5. Ability and fitness per probation record — Registry record.
6. Actively teaching in a public school.
7. Practice teaching certificate if basic course does not provide on-the-road instruction.
8. Paid by the school department and all fees collected go into the treasury.

B. Parochial and Private Schools

1. Application on file
2. Same as public school or a letter from the head of the school stating he or she is a member of the faculty (in the latter case — teaching restricted to the particular school).
3. Basic Driver Education course, etc. (as for public school).
4. Ability and fitness (as for public school).
5. Actively teaching in a high school.
6. Practice teaching (as for public school).
7. Paid by the school and all fees collected go into school treasury.

C. Commercial Schools (Licensed Private Driving Schools)

Commercial driving schools offering the programs described in this manual should consult the Driver Education Administrative Guide of the Registry of Motor Vehicles for teacher certification requirements.

Every teacher of driver education (classroom and/or driving instruction) must have a card identifying him/her as a certified secondary school teacher (by the Board of Education) and qualified for fitness and ability to give instruction in driving by the Registry of Motor Vehicles.

This card is obtainable through the Supervisor of Driver Education, Registry of Motor Vehicles, 100 Nashua Street Boston, Massachusetts 02114.

To qualify a teacher must submit the following:

1. An application. (Form is available on request.)
2. Board of Education secondary school teaching certificate. (Originals will be returned.)
3. Certificate or transcript of record for a basic course in driver education, *college level with 3 semester hours credit.* (Originals will be returned.)
4. Certification for at least six hours of practice teaching in the motor vehicle by a certified driver education teacher, if not *included as part of the basic course.*

A driver education certification form like that recommended by the Registry of Motor Vehicles must show that students have completed each phase of the approved course. For both classroom and on-the-road phases the certification letter to the Registry should show successful completion of a minimum of thirty (30) clock hours of classroom instruction, six (6) clock hours of behind-the-wheel driving instruction, and six (6) clock hours of observation time in a motor vehicle, directly supervised by the certified driver education instructor who teaches the course and signs the certificate. (See Appendix for sample letter.)

For the classroom phase only, the letter should show the successful completion of a minimum of thirty (30) clock hours of approved classroom subjects like those specified in the Instructional Program of the Guide. This letter should be presented to the agency conducting the laboratory phase of the program. That agency will apply for the driver education certificate when the laboratory phase has been completed. This phase of the program is offered by a commercial driving school to students who are currently attending or who have completed the classroom phase of the driver education program at another authorized school and is referred to as the Limited Participation Program. (See Appendix for sample letter.)

The certificate will have the date of the letter of recommendation. If, however, the letter is undated or delivered late, the certificate will date from receipt in the driver education office. An individual who deems this unsatisfactory may obtain a predated certificate by providing a letter from the school, signed by the driver education teacher, stating completion date of classroom and driving instruction and of observation. The Registry of Motor Vehicles charges $1.50 for correcting a certificate that has been issued.

The student's legal name must be used in requesting a certificate. Nicknames are not acceptable. The driver education teacher should proofread the letters. His signature indicates everything is correct. If a duplicate certificate is required, submit a separate request form.

To keep an accurate record of the student's progress and to provide the information required, the instructor should record his findings and impressions of the student's classroom and on-the-road performance. (See Appendix for a suitable form.)

The Driver Education Section of the Registry of Motor Vehicles keeps a complete file of all students recommended by the high schools for driver education certificates during the ten (10) year period of eligibility. Requests for duplicates must be made under separate cover to the Supervisor of Driver Education, 100 Nashua Street, Boston, Massachusetts 02114 and must contain the following information:

1. Full name. (If the request is from a young woman who has married since acquiring the original certificate, give both maiden and married names.)
2. Current address.

3. Name of school where classroom instruction was completed.
4. Name of school where behind-the-wheel instruction was completed.
5. Date of birth.
6. Month and year course was completed.
7. Fee $1.50. (Enclose a check or money order payable to the Registry of Motor Vehicles.)

Request for reciprocity on the basis of driver education certificates from other states must be sent to the Registry of Motor Vehicles, Driver Education Section, 100 Nashua Street, Boston, Massachusetts 02114. The official out-of-state driver education certificate (original will be returned) must be submitted, accompanied by the information listed above. After approval by the Driver Education Section, all official out-of-state driver education certificates issued for the classroom phase only will make the holder eligible for six (6) clock hours behind-the-wheel and six (6) clock hours observation at a Massachusetts school before a Massachusetts driver education certificate is issued. No fee is charged. An official out-of-state driver education certificate is awarded after completing a driver education course meeting minimum standards. If approved, the person will receive a Massachusetts driver education certification letter showing he has completed a driver education course meeting Massachusetts standards. This letter will be honored when presented at any registry or insurance company. The fee is $1.50.

Learner's Permit and License Examinations

The superintendent of schools, principal, driver education supervisor, or teacher may request an appointment for a learner's permit or license examination from the branch office manager of the local Registry of Motor Vehicles. The application and fee must accompany the request which will require three (3) weeks for scheduling.

A learner's permit examination consists of twenty (20) questions on the road laws of the Commonwealth and a vision test. A learner's permit must be obtained before behind-the-wheel training can begin. A minimum of thirty (30) and a maximum of sixty (60) applicants will be scheduled for each examiner per day. Examinations will be scheduled in adequate classroom facilities on the hour — ten (10) applicants per hour, at 9:00, 10:00, and 11:00 A.M.; 1:00, 2:00, and 3:00 P.M.

A license examination consists of a road test in a motor vehicle. A minimum of nine (9) and a maximum of eighteen (18) applicants will be scheduled for each examiner per day. Adequate office space and road conditions must be provided for examinations scheduled on the hour — three (3) applicants per hour, at 9:00, 10:00, and 11:00 A.M.; 1:00, 2:00, and 3:00 P.M. The applicants will be absent from their classroom for a maximum of one hour. Only applicants who are enrolled in the driver education course can be examined.

Disabilities

An applicant with certain disabilities will not be examined unless the application has been approved by the Medical Affairs Branch of the Registry of Motor Vehicles. These disabilities include paraplegia, hemiplegia, spastic paraplegia, spastic paralysis, Parkinson's disease, Huntington's chorea, epilepsy, head injuries, mental disorders, multiple sclerosis, lateral sclerosis, muscular dystrophy, heart disorders, and diabetes. Applicants who report poliomyelitis, osteomyelitis, hearing defects, amputation of arms, legs, fingers, or toes, removal of an eye, or loss of sight in an eye may also be examined. Specific information should be noted on the application as to whether the right or left arm or leg is affected and whether amputations are above or below the knee or elbow. If the applicant has lost, or lost the use of, a hand or foot, the examiner must determine the specific equipment necessary to compensate for the disability. The application will not be approved if the loss of, or loss of use of, a hand or foot is due to a disease.

Parental Consent

A parent, legal guardian, or one of those mentioned below must sign both the learner's permit and license application forms for all persons under eighteen (18) years of age. A spouse over eighteen (18) years of age may sign the application of the underage mate. The headmaster of a boarding school may give consent for a minor who is a full-time boarding student at his school. The Registrar has determined the spouse or headmaster is standing in place of the parent.

Major and Minor Accidents

The operator of a vehicle involved in an accident shall:

1. Stop immediately.
2. Position the vehicle so it does not interfere with traffic or cause another accident, if possible.
3. Check for and assist injured when possible. If unaware of simple first aid, seek assistance.
4. Notify police as soon as possible. (They can reach all emergency equipment and personnel more easily than the driver.)
5. Answer questions about names, addresses, vehicle registration, driver's license, learner's permit, and instructor's certificate information. Obtain similar information if accident involves another vehicle.
6. Discuss accident details and information courteously with proper police authority.
7. Decline to sign any statements, since this is not required.
8. Collect facts for accident reports:
    a. Time, location, direction of travel before and after accident
    b. Permanent identification marks like telephone pole numbers and mileage markers
    c. Any and all measurements, possibly diagrammed
    d. Weather and road conditions — wet, sandy, and so forth
    e. Names of all witnesses like passengers in vehicles and people standing nearby
9. Avoid getting into arguments, making accusations, or admitting to faults.
10. Notify the school authority he is directly responsible to as soon as possible. Suggest to the police that the supervisor of driver education, assistant principal, and principal be notified. The parents of injured students should be notified by the proper administrative personnel when possible.
11. Leave name and address in conspicuous place and report incident to police when parked cars or private property is damaged and the owners cannot be located.

Reports

All accidents should be reported to the local police, the school administration, insurance company, and other concerned parties regardless of how trivial the accident. When someone has been killed or injured or the apparent property damage to any one vehicle or other property exceeds $200.00, the instructor must file a written report on an official form with the Registrar of Motor Vehicles and the local police department within five days. Forms are available at all police stations and registry offices.

Teacher Liability

Chapter 691 amends Section 100-C of Chapter 41 to provide that if any employee of a school committee, operating within the scope of his employment, is sued for damages to property or injuries to students, the school committee must assume the cost of legal defense and of any judgments levied against the employee.

CURRICULUM FORMAT

Part	Specifies the major category of tasks to be studied.
Unit	Narrows the major category.
Episode	States the number and specific concept in order of difficulty.

EPISODE PRINCIPLE Expands the episode concept by stating a fact or a generalization accepted as true and basic.

EPISODE PURPOSE Identifies the ways the episode can assist the learner perform a major driving-related task and function in the highway transportation system with continuing improvement.

Concepts	Supporting Principles	Behavioral Objectives
Concepts supporting the episode are numbered and listed here in an order promoting sequential learning. They may be re-ordered to take full advantage of strengths in teachers and programs.	The statements in this column support and extend the episode concept. The central thought for each supporting concept is stated for easy reference. Additional information for each concept and principle is outlined on the resource information pages following each episode.	Identified here are the behaviors the learner is expected to exhibit after instruction. The learning experiences may be a part of one or several lessons. In most cases, a behavioral objective is written for each supporting concept. Objectives have been prepared in the following learning domains: *Cognitive:* These objectives identify behaviors relating to the intellectual processes of the learner and usually describe knowledge, comprehension, and intellectual skills. Most represent the things the learner can do as the result of instruction. They often state the conditions under which the behavior will be exhibited but rarely identify the criteria for acceptable performance. The teacher may set the standards. Students should be informed of these objectives. *Psychomotor:* These objectives identify neuromuscular or physical skills involving certain manipulative operations. *Affective:* These objectives identify behaviors involving attitudinal, emotional, and value responses of the learner and are usually described as interests, appreciations, and attitudes. They are examples of the behaviors the learner will exhibit after instruction. They may not be observed for several weeks or even months. One affective domain objective is identified for each episode. Students should not be informed of these objectives.

Learning Activities

Listed in this column are activities the teacher may use to achieve the behavioral objectives for the episode. Activities are listed that permit the learner to practice the behavior implied by the objective. The list is not complete or restrictive, but can be expanded to make the learner's experiences relevant to a local situation. Most of the suggestions apply to classroom activities, and several in-the-car activities suggest further classroom activities. Methods to be used by the in-the-car instructor are not elaborated. It is recommended that assignments and discussions be incorporated in laboratory as well as classroom instruction.

Evaluation

The material in this column suggests means to evaluate a student's achievement in terms of the behavior identified in the episode objectives. In many cases, alternate methods of measuring student progress are available. Traditional instruments (standardized tests accompanying textbooks) are currently being used by many driver education instructors. The teacher should attempt to develop instruments to test the learner as he performs the behavior stated in the objectives.

Cognitive: Some episodes suggest a method to evaluate each behavioral objective in the cognitive domain. Others suggest a way to evaluate several objectives with one instrument.

Psychomotor: A learner may know the procedures for performing various driving tasks, but the true evaluation of this knowledge is his performance. Only a few suggestions are made in the guidelines, but many cognitive domain objectives, especially on-highway-tasks, imply evaluation of psychomotor skills and operations.

Affective: Affective learning is difficult to measure for several reasons. The advisability of evaluating learning domains separately is controversial. Very few valid instruments are available. Suggestions are only indicators for the teacher and, for the present, should not be used to determine students' grades.

Resource Information

Background data is provided for every episode. The information supports each concept and principle listed. It is not meant as a student textbook, a teacher lecture outline, or the only resource for data.

Curriculum Structure

The curriculum is structured around tasks vital for driving and traffic safety. The tasks the learner performs on and off the highway encourage competent vehicle operation. Applicable laws, both natural and man-made, are integrated with tasks. Contribution to a driving-related task was the criterion of inclusion in the proposed curriculum.

Driving-Related Tasks

Four major categories of driving-related tasks have been identified under which other sub-tasks fall: orientation, on-highway, readiness, and improvement.

Before the learner functions in the highway transportation system, he needs *Orientation Tasks* (Part I). Orientation tasks consist of system components and controls, user licensing requirements, and an analysis of the driving task (Unit A).

As a vehicle operator, man's role in the system consists of *On-Highway Tasks* (Part II). The sub-tasks are Basic Control Tasks (Unit A), Interacting With Highway Environment (Unit B), Critical Situations (Unit C), and Controlling Consequences of Highway Collisions (Unit D).

The probability of successful operation in the system is affected by the degree of competency in the *Readiness Tasks* (Part III). Those tasks include Operator Fitness (Unit A), Vehicle Readiness (Unit B), Trip Plan (Unit C).

The fully functioning member of the highway transportation system can better the system through *Improvement Tasks* (Part IV). The two sub-tasks in this part are Self-Improvement (Unit A) and System Improvement (Unit B).

Primary Aims of Driver and Traffic Safety Education

The task analysis and subsequent curriculum structure suggest the primary aims of driver and traffic safety education. Each part of the curriculum corresponds to a primary aim. The teacher must work to:

1. Familiarize students with components and task requirements of the highway transportation system (with a role identified for each user).
2. Enable students to enter into the highway traffic system as vehicle operators with at least minimum performance capabilities.
3. Equip students with the knowledge and thought processes to make wise decisions in situations that could lead to impaired driving performance.
4. Help students acquire the insights and motivations to become fully functioning operators and responsible members of the system.

Central Goal

The central goal of driver and traffic safety education is to improve and encourage continuing improvement in the quality of human decisions and performance tasks related to the system. To the degree educators are successful in attaining this goal, the probability operators will drive from origin to destination safely, expeditiously, conveniently, and economically increases thereby serving the individual and the system.

Suggestions for Use

The Guide can be effectively used if these guidelines are followed:

1. The Guide is for the teacher's not the student's direct reference, although it identifies objectives that should be released to the student.
2. The Guide is only a suggested curriculum for local driver-education teachers and planners. The sequence and depth of material presented can be modified, but care should be taken not to lose the task analysis approach.
3. In both the curricular guidelines and the resource information, the material is comprehensive but not exhaustive.
4. Not all the materials or objectives have to be included in the driver education curriculum. The school's scheduling, organization, philosophy, and teachers will determine the extent to which the guidelines may be implemented.
5. The Guide may make a single textbook an adequate resource for students. The teacher, however, may wish to use several textbooks to enhance and enrich the learning process.
6. A suggested scheme for developing a lesson plan and a sample plan is included in the Appendix. The scheme is not meant to be the only way to implement the Guide in the classroom and laboratory but rather a guideline to help teachers improve instruction.
7. The Guide is a springboard for the improvement and expansion of driver and traffic safety education in the Commonwealth.

Part I Orientation Tasks
Unit A Highway Transportation System
Episode 1 Man and the System

EPISODE PRINCIPLE The efficiency of the highway transportation system depends upon the performance of both public officials responsible for developing and managing the system and highway users as they relate to the system.

EPISODE PURPOSE This episode is designed to help the student to acquire a comprehensive picture of the goals, components, and forces involved in the highway transportation system and to learn the various ways he can contribute to system efficiency and improvement. A term project is initiated to help the student learn how to participate in activities related to traffic management.

Concepts	Supporting Principles	Behavioral Objectives
1.1 System	A system is an orderly arrangement of components and sub-systems serving to perform some task in a given environment.	*Cognitive* Identify the characteristics of a system.
1.2 Highway Transportation System	The highway transportation system, a sub-system of the national transportation system, is composed of many man-machine-environment combinations interacting in a loosely coordinated fashion.	Describe the major components of the highway transportation system and compare their characteristics with similar components in rail, water, and air transportation systems.
1.3 Highway Safety Management	Many forces working together at the federal, state, and local levels help to develop and manage the highway transportation system.	State the forces designed to manage the highway transportation system and describe the function of each.
1.4 System Performance Criteria	The overall performance of the highway transportation system can be assessed in terms of certain criteria.	Identify the criteria used to evaluate the overall performance of the highway transportation system and compare these measures with the goals of individual highway users.
1.5 Non-operator Responsibilities	Responsibility with respect to the highway transportation system extends beyond what one does as a vehicle operator. It includes non-operator activity that contributes to overall system efficiency and improvement.	Distinguish between non-operator and operator tasks.
		Affective Recognize that the efficiency of the highway transportation system can be improved by individual highway users.

Learning Activities	Evaluation
1. Define and give characteristics and examples of a system. The students then identify the systems they are familiar with and tell why each fits the definition of a system.	*Cognitive* Name a system and several characteristics, some related to it and others not related. The student selects the characteristics of the system that was named.
2. The students list the variations in vehicles, highways, and drivers that characterize the highway transportation system and then compare this system with rail, water, and air transportation.	Writes a description of the highway transportation system components and compares them with rail, water, and air transportation systems.
3. Question the students to discover the forces they are familiar with and supply those they do not mention.	Writes the names of the forces and describes the function of each.
4. Delay a full treatment of non-operator tasks. If a system improvement project is to be required, however, it should be initiated early in the course. Refer to Part IV, Unit B, Episode 3 for suggestions and guidelines.	Evaluation criteria are listed, and the student lists goals of individual highway users.
	Several user tasks are listed. The student indicates which are operator tasks and which are non-operator tasks.
	Affective Lists a few projects he may explore to improve the highway transportation system and describes how he would approach each problem.

Resource Information

1.1 *System*

a. Components interrelate and interact with one another.

b. The vast majority of systems are composed of men and machines.

c. Man needs to be challenged but not overburdened.

d. In any man-machine system, some tasks are better performed by man and others are better handled by machines.

e. Human factors engineer attempts to fit the machine and the environment to man's capabilities and limitations, while education and training attempt to fit man to the machine and the environment. (Both efforts strive to minimize error.)

f. A system is effective if it does the job it was intended to do.

1.2 *Highway Transportation System*

a. Machines varying in size, design, function, performance capability, age, and condition are a part of the system.

b. Millions of miles of roads vary in design, construction, and condition. (Many highways are inadequate.)

c. Operators varying in age, skill, knowledge, temperament, physical attributes, and goals operate machines on the roads.

d. Because of the demands driving places on the operator and the serious consequences that can result from poor performance, driving is one of the most hazardous activities people engage in. Highway transportation is more hazardous than rail, water, and air transportation because:

(1) these other means of travel are controlled, following pre-determined schedules on their own more or less exclusive rights-of-way, with very little traffic congestion other than at ports or terminals;

(2) the highway scene is more congested. Many units meet on the same travelway with no one having exclusive right-of-way; and

(3) except for operators of trucks and buses, most vehicle operators have not had to meet advanced qualifications. Air, rail, and water movements are largely mass transport, controlled by highly qualified operators, adhering to rigid safety rules, and having the benefit of scientific systems of signalling and traffic control.

1.3 *Highway Safety Management*

a. Highway, traffic, and vehicle engineers strive to provide highways, operational controls, and vehicles that enable people to reach their destinations safely, conveniently, and economically.

b. Laws and ordinances supply standards for motorist and pedestrian conduct and serve as a legal framework within which officials can carry out their duties stemming from vehicle operation and pedestrian traffic. (pp. 40-41; DLM)*

c. A driver licensing program helps to limit vehicle operation to persons physically and mentally qualified to drive and also prevents needless denial of the right to drive.

d. Motor vehicle registration procedures furnish rapid identification of vehicle ownership for investigation, law enforcement, and other administrative and research purposes. In addition, registration fees provide income to the state. (pp. 11, 12, 40; DLM)

e. Police traffic supervision is an official control designed to ensure safe and efficient movement of traffic on streets by:

(1) directing and controlling traffic;

(2) enforcing traffic laws; and

(3) investigating accidents.

f. The traffic court, another official control, determines guilt or innocence and imposes penalties in accordance with the law on those who are convicted of traffic violations.

g. Driver and traffic safety education is designed to improve the competency of highway users. Education programs for improving competency of public officials and others engaged in work related to traffic management are available.

h. A system for recording information concerning drivers, vehicles, volume of traffic, highways, and accidents is the basis for all aspects of a coordinated traffic safety and vehicle usage program.

i. An effective program of emergency medical care and transportation for those injured in traffic accidents reduces the number of deaths and the consequences of injuries.

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*Refer to Commonwealth of Massachusetts "Drivers' License Manual" — Class 3 and Motorcycle for additional information.

j. Federal legislation enacted in 1966 requires that all new vehicles incorporate safety features progressively and that a federal mechanism be established to help states and communities develop coordinated, effective highway safety programs.

k. Organized citizen support groups cooperating with public officials are essential for an optimum highway transportation system.

1.4 *System Performance Criteria*

The performance of the highway transportation system can be assessed in terms of:

a. The number of people and the amount of goods which can be moved.

b. The geographical locations between which movement can occur on roads.

c. The time it takes to complete movement between various locations.

d. Collisions which prematurely terminate or interrupt movement. (See Part II, Unit D, Episode 1, for information on the traffic accident problem).

e. Cost factors.

1.5 *Non-operator Responsibilities*

a. The operator's role calls for more than just driving safely.

b. Non-operating tasks involve system improvement.

Part I Orientation Tasks
Unit A Highway Transportation System
Episode 2 User Licensing Requirements

EPISODE PRINCIPLE To acquire and retain a license to operate a vehicle, a driver must comply with Massachusetts licensing laws.

EPISODE PURPOSE To participate in laboratory instruction behind-the-wheel, the learner must have a Massachusetts learner's permit or driver's license. The information in this episode should help the student acquire sufficient knowledge of the State's legislation, rules, and regulations relating to motor vehicles to secure a learner's permit and to begin operating a motor vehicle.* Minimal class time should be given to this episode.

Concepts	Supporting Principles	Behavioral Objectives
2.1 Learner's Permit	A person is required to have a learner's permit while learning to operate a vehicle in Massachusetts.	*Cognitive* Identify those Massachusetts laws which relate to a learner's permit.
2.2 Driver's License	Every Massachusetts resident driving a motor vehicle must have a valid driver's license.	Describe the process for obtaining an operator's license at the Registry of Motor Vehicles.
2.3 Registration Requirements	A vehicle must be registered before it can be operated on the highways of Massachusetts.	State requirements for registering a vehicle in Massachusetts.
2.4 Out-of-State Operators and Vehicles	Some licensing and registration privileges are granted to non-residents.	List those out-of-state persons and vehicles eligible for licensing and registration privileges.
2.5 Rules of the Road	The rules and regulations relating to motor vehicles are laws enacted by legislation.	Describe the laws, traffic control devices, and highway markings enforced on streets and highways.
2.6 Operating Condition of the Vehicle	Any motor vehicle operated in Massachusetts must be equipped with certain devices of an approved type.	List approved types of required vehicle equipment.
2.7 Safe-Driving Procedures	Many safe-driving procedures and regulations exist in Massachusetts.	State laws and practices regarding night driving, super highways, serious offenses, and accident involvement.
		Affective Attempt to learn contents of the Massachusetts "Drivers' License Manual"—Class 3 and Motorcycle.

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*Throughout the course, the teacher should reinforce knowledge of the laws when laws relate to the task being learned. Reference is made to the laws throughout the Guide on the resource information pages.

Learning Activities	Evaluation
1. Each student should have a copy of the Massachusetts "Drivers' License Manual" — Class 3 and Motorcycle to use during the course. Most students should be capable of learning the content in Part I well enough to answer review questions on pp. 46-51. 2. The students may be held responsible for the contents of the manual with the understanding that a test will be given at the following class session. Teacher analysis of test results will identify those students needing additional help and those laws needing clarification through class discussion.	*Cognitive* An objective test can be used to evaluate student achievement on these lower level cognitive skills. The results indicate to the instructor the laws needing clarification and emphasis during the program. Students who do not achieve all the desired outcomes should be given special assistance to learn the laws. *Affective* Studies the "Drivers' License Manual" — Class 3 and Motorcycle individually or with others and seeks help as needed.

Resource Information

"Legislation, Rules and Regulations Relating to Motor Vehicles" for the Commonwealth of Massachusetts should serve as a basic resource for this episode and all following episodes. The driver educator should keep informed of all new revisions in laws and rules and regulations on driving in Massachusetts and implement them in the curriculum. The Public Relations Section of the Registry of Motor Vehicles supplies "Amendments of Revisions to the Motor Vehicle Laws" upon request.

Part I Orientation Tasks
Unit A Highway Transportation System
Episode 3 Human Functions and Driving

EPISODE PRINCIPLE In operating a motor vehicle, man functions as a sensor, an information processor, and a controller.

EPISODE PURPOSE Human functions, mental as well as physical, are involved in performing the many tasks and sub-tasks of driving. Regardless of whether the operator is negotiating a curve, passing another vehicle, or parking, he must identify the traffic scene, make predictions and decisions, and implement his decisions. The information in this episode should help the student acquire a mental picture of the functions as they relate to the driving task. This background is important because the functions serve as fundamental concepts, connecting points, and goals for the entire curriculum.

Concepts	Supporting Principles	Behavioral Objectives
3.1 Identify	One of the basic operator functions in the driving task is to acquire and maintain a clear, complete, and accurate picture of the traffic scene in order to *identify* any critical objects or changes which may require compensatory equipment.	*Cognitive* Write a description of the four human functions involved in operating a motor vehicle. List the functions with their essential elements in correct and related sequence.
3.2 Predict	After the operator identifies the position of important elements (cues) in the traffic scene and their relationship to each other, he must project and *predict* possible future relationships and outcomes, constantly hypothesizing about what will or might be.	
3.3 Decide	Formulating a course of action with the intent to execute it makes up the *decision-making* function in operating a motor vehicle. An operator makes predictions on the basis of his perceptions and then makes decisions on the basis of his predictions.	
3.4 Execute	The sensory and mental functions (identification, prediction, decision) finally culminate in the performance function as the operator *executes* his decisions related to direction, speed, and communication with other highway users. Failure to execute is failure to do what was intended but is not a mistake in decision.	
		Affective Accept the theory that the major driving tasks are mental as well as physical.

Learning Activities	Evaluation
1. To initiate this episode ask the following question: What abilities other than motor skills are needed in driving? Through responses to this and follow-up questions, the class begins to form a picture of the functions needed to operate a motor vehicle. The teacher then fills in whatever details he feels are appropriate at this stage, using printed materials and visuals to facilitate meaningful learning. Part of a driving film which emphasizes the mental processes involved in competent operation may be shown. 2. Students print the names of the functions on large cards. The cards are placed permanently in the classroom for all to see. 3. Students illustrate the functions on large pieces of posterboard. These can serve as reference during the entire classroom experience.	*Cognitive* Show 2 pictures. The first of a car in a local traffic situation (an intersection) and the second of the vehicle after it has passed the situation. The student lists on paper those functions the competent driver performs during the time lapse between the two situations. *Affective* When asked to develop what he feels are the main goals of driver and traffic safety education, student's response reveals the mental processes used in driving.

Resource Information

3.1 *Identify*

a. A person is somewhat like a computer with numerous inputs or channels of information flowing in through the sensory equipment.

b. Vision is the primary medium through which the operator acquires environmental and vehicular information.

(1) Visual observations are limited by the physical ability of the eyes to see clearly (acuity), judge depth and distance, distinguish colors, see in low illumination, and adapt to glare.

(2) Central vision consists of a relatively small angle and focuses on only one thing at a time, but fringe vision, which is much wider, enables the driver to observe important cues in the upper, lower, and side range of vision.

(3) The eyes focus on only one thing at a time but can move very rapidly from one thing to another.

(4) Actual reading or observing of events is accomplished during the seconds the eyes fixate.

c. For optimum information acquisition, the operator needs to use a consistent, systematic, and aggressive search pattern.

(1) The eyes should continuously scan road location and characteristics; location, movement, and movement potential of other highway users; traffic control signs and signals; fixed objects near the road; and the vehicle's instrument panel.

(2) Although an effective search pattern encompasses the total traffic scene (front, back, and sides), it concentrates on the various sectors in proportion to the likelihood of hazards.

(3) A scanning pattern employing the brief glance technique enables the operator to maintain continuous awareness of his relationship to conditions ahead and, at the same time, acquire a picture of conditions elsewhere that could affect his decisions.

(4) In addition to looking for environmental cues, the driver needs to monitor the location, movement, and functioning of his own vehicle in the environment.

(5) The best search rate and pattern may not be intuitively obvious to the operator, therefore, he needs to learn proper visual habits. (Research is needed here.)

d. The operator's ability to maintain a search pattern that detects inportant cues without distortions or illusions is influenced by:

(1) the position, intensity, color, contrast, and movement of the stimuli;

(2) the condition of his sensory equipment, particularly the eyes; and

(3) distractions outside the vehicle, inside the vehicle, and within himself.

e. Besides visually acquired information, the operator identifies important cues through his other senses.

(1) The operator should have a feeling for what the car is doing through physical contact with the seat, floor, brakes, and steering wheel.

(2) Auditory cues can help the operator to evaluate vehicle performance and to sense adjustments needed in relating to other highway users and the environment.

f. From the eyes and other sensory equipment, messages go to the brain. There they are translated into meaningful information through a sorting and analyzing process commonly referred to as perception.

(1) Because of physical and psychological factors, the brain does not notice everything that is visible. It selects only those incoming sensations it wants to consider.

(2) The stimuli selected and identified depend upon the degree of threat, previous experience and learning, and motives and emotions in play at the time.

(3) As the number of elements (cues) to be identified increases, the chance of missing an important cue increases. Each element tends to distract the operator.

(4) Sometimes relevant information is ignored because of an information overload, while on the other hand, an information underload tends to cause the operator to disassociate himself from the task (limited access highways).

(5) Failure to identify cues correctly or quickly enough can break the operational chain for selecting a safe field of travel.

g. Operators predict, decide, and act, not according to what things are really like, but according to their perception of what they are like. If driving actions are to lead to the expected results, perceptions must correspond closely to reality.

(1) The eyes and brain do not merely register some objective portrait of objects, events, and people. The act of seeing is warped by what a person wants and, in a sense, needs to see.

(2) Before sensory impulses reach the reasoning center of the brain (cerebrum), they take on the emotional characteristics of a person's values, motives, and personal needs.

(3) People see what past experiences and associations have conditioned them to perceive.

3.2 *Predict*

a. The operator must compare and correlate man-machine-environmental relationships affecting his progress with his stored knowledge and insights related to:

(1) traffic laws and controls;

(2) physical forces;

(3) human characteristics and driving norms;

(4) vehicle dynamics; and

(5) other concepts related to road and traffic conditions.

b. Judging time-space relationships between his vehicle and other elements in the system both fixed and moving is crucial and difficult for the driver.

(1) Judging closing rate and on-coming vehicle speed is especially difficult.

(2) Making time-distance judgements on dynamic (moving) elements depends on fixation time as well as experience in making similar judgments.

(3) Making judgments of time, space, and speed become more difficult, as the operator increases speed and operators around him increase speed.

c. In a non-social driving situation (no other highway users nearby), the accuracy of the operator's predictions depends mostly upon his understanding of the physical principles involved in the man-machine-environmental relationship (friction, inertia, gravity, braking distance).

d. The traffic situation is predominantly a social situation, therefore, the operator needs to predict the probability of other highway users occupying his path at the same time.

(1) Predictions related to other highway users are more subjective and unpredictable than those related to physical elements in the environment. The operator should consider what the other driver might do.

(2) The operator knows very little about the physical, mental, and emotional state of other highway users. Although there are operators on the highways today afflicted with serious physical and mental disorders, efforts are being made to identify and ground those who are unfit until their impairing condition has been cured or properly controlled.

(3) Expecting and being prepared for the unexpected or the worst behavior on the part of others usually affords the driver time and space to take evasive action.

(4) Deviant action by operators does not necessarily imply anti-social motivation. (Surveys show that most persons driving with their headlights on high beam at inappropriate times are doing so unintentionally.)

(5) The validity of predictions and expectations increases as communication between highway users through such means as directional signals, brake and back-up lights, position of vehicle, horn, speed changes, body lean of vehicle, and eye-to-eye contact increases.

(6) In addition to the usual cues related to the other operators' intentions, sometimes the age, number of passengers, and actions of the drivers or passengers in the other vehicles reveals what might be expected.

(7) Quality of predictions can be increased if the operator considers not only how the situations appear to him but also takes into consideration how the situations appear to other users around him and what his behavior means to the others.

(8) In predicting the actions of other highway users, the operator is aided by a set of rules and norms serving to coordinate the interaction of highway users by limiting path speed alternatives (land markings, signs and signals, right-of-way laws, and speed controls).

(9) While a prudent operator is guided in his predictions by the behavior of other highway users, he is prepared to make adjustments in case his predictions are not borne out.

e. In predicting the potential movement of other types of vehicles, an operator should consider the attributes and capabilities associated with each.

(1) Motorcycles: change direction suddenly; are not easily seen; their speed is difficult to judge; are unstable compared to four-wheel vehicles; are more susceptible to loss of control; the operator

has excellent forward vision but rear view mirrors may be ineffectual; reaction time of the operator is less since both hands and feet are placed on the controls; the operator may be less attentive to the driving task since the nature of the vehicle is sporty.

(2) Trucks and buses: require more space in which to maneuver; tend to slow down going up a steep incline, but pick up speed going downgrade; require more time to pass another vehicle going in the same direction; create visibility problems for other operators; drivers are usually performing under a time schedule; truck drivers are typically skillful, helpful, and courteous.

(3) Compacts and sport cars: are influenced greatly by winds; are difficult to see in blind spots and dips in the road; other drivers find it hard to judge their speed and distance; turning radius is less; design features create a larger blind spot for their operators; deviation from given path may be more abrupt; it is difficult to predict their acceleration capabilities because of big differences in motor size and compression rates.

(4) Others: bicycles; emergency vehicles; entertainment oriented vehicles; farm vehicles; horse-drawn vehicles; and snowmobiles.

f. Any traffic situation containing several threatening elements presents a prediction problem for the operator that is greater than the sum of the separate problems posed by the individual elements.

(1) Seldom are there any loose, isolated elements in the traffic scene since the changing of one element usually changes the meaning of another. A dog on the shoulder of the road in front of the operator is mutually related to the oncoming vehicle and the traffic in back of him.

(2) Multiple elements increase the probability that the worst will occur. The fact that more possibilities *can* occur increases the chance that something will occur.

(3) Multiple hazards usually create a situation in which solutions conflict with one another. (Giving an animal on the shoulder a wide berth, increases the threat from an oncoming vehicle.)

3.3 *Decide*

a. The uncertainty, unpredictability, and complexity of the traffic environment generates for the operator many and varied decision problems ranging from minor automatic to highly complex. The simple and routine decisions need to become habitual, allowing the higher center of brain activity additional time for more difficult or complex decisions.

b. Due to the additional burden of sorting and analyzing the sensory data, decision time increases as the number of choices increases. Difficulty in making the decision also increases the time that the driver must have to carry out the decision.

c. Most of the decisions in driving relate to anticipating the threats from the traffic environment and other highway users and then adjusting to those threats through proper positioning (allowing a space cushion) and speed.

(1) By decreasing speed and/or increasing the distance from hazards, the operator can have more time to identify, to predict, and to decide upon a wise course of action.

(2) Speed relative to the speed of other vehicles is as important as the operator's own speed in miles per hour. When he is out of tempo with other traffic (too fast or too slow), passing and other situations are created which disturb traffic flow and create hazards.

(3) In situations of limited space (intersections, merging, passing, parking lots), speed control is the only means available to avoid conflict with other highway users.

(4) Since man is a poor detector of relative velocity between his car and other cars (especially at night), he should allow a margin of error through increased following distance and reduced speed.

(5) Proper positioning of the vehicle provides the operator ample sight distance for efficient tracking and full viewing, and affords him adequate time and space to make unhurried decisions and judgments.

d. Because of the compounding effect of multiple elements in the traffic scene (referred to in 3.2f.), operators benefit from decisions that reduce the number of elements they must contend with simultaneously.

(1) *Where* operators meet moving vehicles, pedestrians, and animals can be controlled by speed adjustment. (Speed should be adjusted to avoid meeting an oncoming vehicle or any other hazard, for example, an animal on the highway.)

(2) Usually operators can determine *where* they will execute maneuvers (backing, parking, turning around, lane changing, and passing). These ma-

neuvers should be avoided if dangerous highway or traffic conditions exist.

(3) A driver should adjust the heater, light a cigarette, converse with passengers, and perform other non-operational tasks only when the vehicle is under control and only when traffic conditions are relatively free of hazards.

(4) Weather, road design and condition, and other factors not under the control of the operator make it especially important for him to use the means at his disposal to avoid multiple dangers.

(5) Pre-trip decisions can reduce many possible combinations of dangerous elements (destination clear, congested areas avoided, children entertained, driver and vehicle fit).

(6) Whatever compromise might have to be made in facing multiple hazards, the operator should decide upon a course of action that minimizes the probability of conflict with another highway user.

e. No one is authorized to take the right-of-way if doing so threatens life or property. (pp. 15, 16; DLM)

(1) Right-of-way laws spell out which highway user takes precedence over another in situations of potential conflict. Usually, the law places the emphasis on which driver shall yield.

(2) One should never take right-of-way privileges until he is sure other drivers are yielding, regardless of the other person's faulty driving or unobservance of the law.

(3) Even if a driver does have the right-of-way, he still can be held responsible for an accident (contributory negligence) if he had the last, clear chance to avoid the collision but did not take it. An analysis of two-car collisions reveals that in most cases, particularly at intersections, both drivers contributed to the accident.

(4) Being legally right does not eliminate the suffering or inconvenience caused by an accident.

(5) Errors on the part of one operator may be compensated for by mature judgment and skill on the part of other drivers.

f. Speed and quality of decision-making varies from person to person, depending largely on the individual's previous experience and familiarity with the situation. Young drivers can hasten the development of decision-making capabilities by:

(1) improving their information gathering and predictive abilities;

(2) learning the principal response alternatives available to them;

(3) identifying the mental errors they should guard against; and

(4) analyzing driving situations that create problems.

3.4 *Execute*

a. As the driving scene changes, the operator tries to compensate for or match these changes by a series of properly timed, semi-automatic, physical responses. The more a person drives, the more habitual these responses become.

b. Success in driving depends on the operator's speed and precision in manipulating the:

(1) controls for regulating power and velocity;

(2) steering wheel for guiding the vehicle;

(3) controls for slowing and stopping; and

(4) controls and actions for communicating and signalling.

c. Learning to manipulate the controls in a prescribed sequence, facilitates habit formation and thus helps to assure safety and efficient performance.

d. Motor responses are relatively simple, easily mastered, and relatively invariant once the operator is familiar with the vehicle and knows the relationship between his control input and the vehicle output.

e. The operator controls the movement of his vehicle in both the lateral and longitudinal dimensions of the environmental space.

(1) The steering mechanism represents the primary vehicle mechanism for lateral control and thus vehicle path.

(2) The accelerator and brake are the primary mechanisms for longitudinal control.

(3) Lateral and longitudinal controls relate, particularly at higher velocities, when inertia forces limit the safe turning angle.

f. Two performance measures which reflect the speed and precision with which the driver used the controls are the number of speed changes over time and the number of direction changes over time.

g. Differences in over-all response time (time from identification through execution) are due mostly to the speed and quality of the information processing and decision function rather than differences in simple reaction time.

h. The competent operator rarely has to depend on his reaction time per se (time between decision and execution) to avoid a conflict, because he has already anticipated and compensated for the impending threat.

i. When the stimulus of a dangerous situation is sufficiently violent, the operator either breaks down and allows a reflex, or impulsive, action to take over or he freezes. (The information processing function is by-passed.)

j. The consequences of all control actions are invariably made known to the operator by comparing his neuro-muscular responses and "feel" with the resulting changes in location and speed.

(1) Feedback is a very important means of identifying the compensatory changes in the vehicle's direction and speed needed to achieve an optimal state in the traffic scene.

(2) When feedback is eliminated or restricted because of fog, snow, or darkness, driving becomes extremely difficult and dangerous.

(3) To the experienced and competent operator, the vehicle becomes, in a sense, an extension of his body.

Part II On-Highway Tasks
Unit A Basic Control Tasks
Episode 1 Vehicle and Road Surface Interaction

EPISODE PRINCIPLE Control of vehicle movement depends substantially upon the friction on small spots where the flattened out parts, or footprints, of the tires contact the roadway.

EPISODE PURPOSE The operator communicates with his vehicle and the roadway through the steering control, accelerator, and braking control. Whether or not the vehicle responds as anticipated depends upon the effectiveness of the control devices plus the friction between the tires and the road surface. The activities in this episode should help the student develop an understanding of the concepts and the principles related to tire-road interaction necessary to maintain equilibrium between the vehicle and the road.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Friction	Friction is the resistance to motion between two surfaces.	*Cognitive* Classify kinds of friction (static, sliding, rolling, and internal). List general conditions that determine the amount of friction between two surfaces.
1.2 Traction	Traction (adhesive friction) is essential to vehicle control.	Describe the role of traction in maintaining vehicle control.
1.3 Road Surface Factors	Many factors affect the gripping efficiency of road surfaces.	When shown pictures of roads, identify and appraise conditions that influence the gripping efficiency of the road.
1.4 Tires	Tires are an integral part of the braking system, steering system, and drive train, transmitting the power from the engine to the roadway.	When given a series of situations related to tire selection and condition, identify the implications for traction.
		Affective Accept the influence of friction upon vehicle control.

Learning Activities

1. Demonstrate and explain the various types of friction:

(1) Static friction: Place a book on a desk.
(2) Sliding friction: Attach a rubber band to the book and pull it across the desk. The rubber band stretches, indicating resistance due to friction.
(3) Rolling friction: Place two cylindrical pencils under the book and pull the book again. The rubber band stretches less than before, indicating less resistance and less friction.
(4) Internal friction: Each student rubs an eraser on his desk and notes that the eraser and the surface rubbed get warm from internal friction. Car tires react in much the same way.

2. The students demonstrate sliding friction, utilizing a variety of different materials for the two surfaces. The changes in the resistance are noted (friction) as the various materials are employed. For example, a metal, wood, and rubber object is substituted for the book. The desk surface is altered by adding sand, lubricant, and water.

3. Display sections of tires:

(1) Bald tire
(2) New tread
(3) Wide oval tire
(4) Snow tire
(5) Underinflated — worn
(6) Overinflated — worn

Evaluation

Cognitive
Given various examples of friction, the student classifies them according to the kind of friction they exemplify. He also identifies those factors influencing the amount of friction from a list of possible factors.

Writes a description of the role of traction in vehicle control.

Local situations are shown, and the student identifies the influencing factors in road gripping efficiency.

Affective
While in the driver education car, the student identifies various road and tire surface conditions and adjusts vehicle speed and direction.

Resource Information

1.1 *Friction*

a. Four basic kinds of frictions are:

(1) static friction — the holding force between two surfaces at rest;

(2) sliding friction — the resistance to motion between two surfaces which are moving across each other (somewhat less than static friction);

(3) rolling friction — the resistance to motion of a rolling object like a ball, cylinder, or wheel (small compared to static or sliding friction, which is the reason for using wheels instead of sled runners); and

(4) internal friction — the resistance to motion within elastic objects. (Tires get warm from internal friction as they flex.)

b. The amount of friction between two surfaces depends upon the:

(1) substance of the material — metal, wood, rubber (the softer the material, the more friction);

(2) roughness of the surfaces (the rougher the surface, the more friction);

(3) amount of force pushing the surfaces together (the more force, the more friction); and

(4) presence of lubricants (oil, water, leaves) which tend to hold the surfaces apart thereby reducing friction.

c. The amount of friction between two surfaces (coefficient of friction) is calculated by dividing the amount of force necessary to pull one surface over another by the amount of force pressing the two surfaces together (weight).

1.2 *Traction*

a. Traction is needed on the drive wheels to move the vehicle, the front wheels for steering, and both front and rear wheels for directional control and braking.

b. A spinning wheel (sliding friction) does not provide as much traction as a rolling wheel; therefore, the skill of starting a car on a slippery surface lies in applying the power to the drive wheels so they do not lose their grip on the surface.

c. It takes more force to start a vehicle moving than it does to maintain movement, because static friction is greater than sliding friction, and inertia must be overcome.

d. Normally, a vehicle moves in the direction the wheels are pointing, because the rolling friction of wheels moving forward or backward is much less than the sliding friction of side movement. Exceptions are when:

(1) centrifugal effect in a turn is greater than the frictional force of the tires, the tires slide sideways; and

(2) brakes are applied hard enough to slide the tires, there is no rolling friction.

e. Although traction is increased by the weight of a vehicle, a heavier vehicle does not stop in a shorter distance, because the added traction is balanced by the added inertia of that weight.

1.3 *Road Surface Factors*

a. Surface materials (concrete, asphalt, gravel, dirt) have different coefficients of friction.

b. Dry surfaces have a much greater gripping efficiency than wet surfaces.

c. When rain begins to fall, particularly after a dry spell, the water combines with oil and dirt on the surface to form an emulsion that is extremely slippery.

d. Loose sand and gravel, stone chips, mud, wet leaves, oil, and grease tend to lower gripping efficiency.

e. Ice and snow provide very little frictional grip.

f. Ice patches beneath overpasses, around shaded curves, and in other shaded spots are a deceptive hazard because they thaw more slowly than in areas exposed to the sun.

g. Railroad tracks, steel bridge expansion joints, lattice-floored bridges, and dew on metal manhole covers create a traction problem for the operator of a two-wheeled vehicle. (p. 56; DLM)

h. As the temperature rises within the freezing range, ice and to a less degree snow become much more slippery. (Braking distance doubles with a temperature rise from 0° to 32° Fahrenheit.)

i. Moisture freezes and thaws on bridges before it does on other road surfaces.

j. Bumpy washboard roads greatly reduce the friction grip of tires on the road. As a result, it becomes difficult to steer and brake. (The vehicle suspension system helps to keep the wheels on the road surface.)

k. The coefficient of friction is likely to be lowest at approaches to intersections because of the wear from vehicle starting and stopping and from oil drippings.

1.4 *Tires*

a. Tire treads provide traction on wet surfaces by furnishing an outlet for water squeezed by the tire groovings as they cut into the film of water.

b. The groovings of tire treads also provide ventilation to combat heat build-up caused by the friction of flexing treads.

c. Variance in tire tread depth and inflation pressure can create steering difficulties, instability, and uneven braking. Rotating tires at regular intervals helps to equalize the wear of all five tires. (p. 34; DLM)

d. Letting air out of tires does not increase traction; it may increase the tendency to skid on turns.

e. Either over inflation or under inflation of tires causes improper contact with the road surface and excessive wear.

(1) Under inflated tires cup in the center, causing shoulder wear and difficult steering especially in cornering.

(2) Under inflated tires overheat from friction caused by sidewall flexing thus reducing the strength and durability of the tires.

(3) Wear confined to the center of the tire indicates that the tire has been over inflated.

(4) Over inflated tires are easily damaged because the cords cannot flex and absorb road shock.

f. Snow tires (including studded tires) improve traction and stopping distance on ice and snow, but tire chains are more effective under those conditions. (p. 36; DLM)

g. Wide, oval tires tend to make lighter vehicles hydroplane on ice and snow.

Part II On-Highway Tasks
Unit A Basic Control Tasks
Episode 2 Pre-starting and Starting Procedures

EPISODE PRINCIPLE Proper preparation of vehicle, driver, and passengers can assist a driver in performing basic control tasks as well as more complex tasks.

EPISODE PURPOSE Before a driver performs any driving task, regardless of complexity, he must check the vehicle and its cargo in addition to starting the engine. The pre-starting and starting procedures necessary to prepare the vehicle for operation are described in this episode.

Concepts	Supporting Principles	Behavioral Objectives
2.1 Pre-driving Inventory	To get off to a good start, certain checks and preparations are essential while approaching the vehicle.	*Cognitive* List steps to be taken before entering the vehicle.
2.2 Getting Ready	Passangers, cargo, and driver are prepared for maximum vehicle control.	Describe and demonstrate preparations essential for a safe trip for passengers and cargo.
2.3 Starting the Engine	Engine starting procedures are performed as a matter of habit.	List in correct sequence steps required to start the engine.
		Affective Accept the responsibility of checking vehicle, passengers, and cargo before the vehicle is moved.

Learning Activities	Evaluation
1. Each of five students acts out the procedures he would use in approaching and entering a car. This classroom activity triggers discussion for developing a list of procedures the majority of the class will accept.	*Cognitive* Lists steps a driver takes as he approaches vehicle, immediately upon entering the vehicle, and as the engine is started. (The real test, however, will be in the driver education vehicle. Does the student practice the correct procedures?)
2. Give the students a list of procedures to follow and practice during subsequent laboratory sessions.	*Affective* Before starting the driver education vehicle, fastens his seat belt and checks to see if all passengers have theirs on.

Resource Information

2.1 *Pre-driving Inventory*

When approaching and entering the vehicle, the driver should:

a. check inflation of tires and direction of front wheels;

b. scan conditions in front and rear of vehicle which could interfere with movement;

c. examine back doors, hood, and trunk lid to make sure they are securely closed;

d. check windows to make sure they are clear and clean;

e. enter the vehicle from the curb side if it creates a hazard to do otherwise. (In light traffic the driver can enter safely from the street side by first checking to see that no cars will be passing at the moment he is entering.)

2.2 *Getting Ready*

a. By forming the habit of properly closing and locking all car doors the driver:

(1) increases the chances of the doors remaining closed in the event of a collision; and

(2) prevents an intruder from opening a door.

b. Proper seat and mirror adjustment and driver position help to produce:

(1) a comfortable ride;

(2) maximum field of vision and sight distance to the rear; and

(3) efficient handling of the control devices in routine and emergency situations. (In some cases, a cushion(s) may be needed to raise the eye level.)

c. The driver and passengers of a vehicle can profit in numerous ways from using seat belts.

(1) The driver can maintain his position for controlling the vehicle during sudden stops, on quick turns, in skids, and in minor collisions.

(2) With all the occupants buckled down, the driver can give his undivided attention to driving and feel free to apply the brakes as hard as necessary if the need arises.

(3) Using seat belts is a safety reminder on each trip, since the driver is admitting to himself that he could be involved in an accident.

(4) Seat belts keep the driver alert by reducing fatigue and hold him in an upright position for better viewing.

(5) Seat belts furnish protection to vehicle occupants in the event of a collision by preventing ejection, reducing the chances of being thrown around inside the car, and absorbing and spreading impact force to parts of the body that can take it.

(6) Not using seat belts may count against the driver in a financial settlement of a traffic accident.

d. Cargo of any kind may block vision or hurtle forward and become a dangerous missile if not stowed properly. A heavy load can change wheel alignment, headlight aim, and braking and acceleration performance.

e. If the driver is not familiar with the car, reviewing the location of the various gauges and devices and manipulating the brake, accelerator, and steering wheel before moving the vehicle facilitates a smooth and controlled adjustment to the car. Checking where brake action begins is best determined when the car is moving slowly.

2.3 *Starting the Engine*

When starting the engine, the driver should:

a. Check for park or neutral gear selection.

b. Place right foot comfortably on gas (more or less pressure as applicable to the vehicle and temperature of engine).

c. Turn ignition switch to start (release switch and gas pressure as soon as engine starts) and check gauges.

d. Place right foot on brake and shift into desired position (palm up).

e. Release the parking brake.

Part II On-Highway Tasks
Unit A Basic Control Tasks
Episode 3 Directional Control

EPISODE PRINCIPLE Reliable and accurate directional control depends upon multiple driver-vehicle-environmental factors interacting closely.

EPISODE PURPOSE The purpose of this episode is to help the student understand man-machine-road interaction, using directional control as a means of developing capability to position his vehicle.

Concepts	Supporting Principles	Behavioral Objectives
3.1 Line of Sight	Centering the line of sight down the path the car should travel and steering toward the center of this selected path help to prevent over steering and under steering.	*Cognitive* Explain why seating position, line of sight, and manipulation of the steering control all influence the operator's ability to maintain directional control.
3.2 Steering and Suspension Systems	Properly functioning and precise steering and suspension systems allow changes in direction to be made accurately and in close accord with the movement of the steering wheel.	Identify the symptoms and possible consequences on directional control of (a) front end misalignment, (b) defective steering mechanism, and (c) worn shock absorbers.
3.3 Weight, Speed, and Vehicle Profile	Weight, speed, and vehicle profile influence directional control.	Relate weight, speed, and vehicle profile to directional control.
3.4 Backing	Backing the vehicle requires basically the same directional controls as moving forward.	Describe procedures to follow while backing the vehicle.
3.5 Two-wheeled Vehicles	Maintaining directional control on a two-wheeled vehicle requires greater skill than driving an automobile. The rider and the vehicle act as a system to control and balance the machine.	Identify special problems related to directional control confronting operators of two-wheeled vehicles.
		Affective Accept responsibility for performing pre-driving habits and considering vehicle capabilities relating to selected vehicle positioning.

Learning Activities

1. Refer to the Smith System — "Aim High in Steering." Proper seating position contributes to proper seeing habits. Relate these habits to the importance of "identify."
2. Have the students identify those laws in the Massachusetts "Drivers' License Manual" — Class 3 and Motorcycle that relate to each concept in the episode.
3. Ask the students to prepare to discuss the following questions:

(1) What are some driving acts which could cause poor wheel alignment?

(2) How can the effect of wind gusts be reduced after passing under an overpass?

(3) Why do weak shock absorbers cause steering difficulty?

(4) Why is backing difficult for the beginning driver?

(5) Why is it more difficult to control the direction of a two-wheeled vehicle than a car?

Evaluation

Cognitive

Writes reasons why the line of sight is so important in driving.

Given several symptoms of vehicle malfunctions influencing vehicle direction, the student identifies malfunctioning equipment and possible consequences.

Takes an objective test.

Lists steps and cautions to follow when backing a vehicle.

Lists several special problems in controlling the direction of a two-wheeled vehicle.

Affective

During laboratory experience the student prepares the car for maximum steering control efficiency and steers the car in a selected path.

Resource Information

3.1 *Line of Sight*

a. Good seeing begins with good seating. The driver should:

(1) sit erectly and squarely behind the wheel with eye level well above the top of the steering wheel; and

(2) look backward to get the whole picture when backing the vehicle.

b. Constant eye movement helps to prevent both the fixed and blank stare (captured attention), enabling the driver to maintain continuous awareness of his relationship to the road. He should:

(1) center on the path ahead;

(2) scan the scene continuously;

(3) check mirrors and dash periodically; and

(4) as he increases speed, search farther ahead for environmental cues that may affect his course of action.

c. Even on a straight road, a car deviates from the path unless the driver looks ahead, recognizes each movement away from the desired path, and makes early corrections for each deviation (continuously steering).

d. Position of the hands on the steering wheel may vary with the design of the seat, the length of the driver's arms, muscular differences, and speed of travel. In any case, the hands should be placed where the driver can steer best.

3.2 *Steering and Suspension Systems*

a. The steering system and front tires utilize friction to provide maneuverability.

(1) As the driver turns the steering wheel, the turning action is transmitted through a gear to the arm and rods that control the front wheels.

(2) When the front wheels are in proper alignment, the tires roll parallel to each other when travelling straight ahead without scuffing, dragging, or slipping. Misalignment can result from worn parts or hard jolts to the front end.

(3) A properly functioning steering system is particularly important in fighting cross winds, negotiating sharp curves, and performing evasive actions in emergencies.

(4) Power steering, through reduced gear ratios, provides fast, positive steering under normal circumstances and helps the driver to retain control under adverse circumstances (blowout, chuck holes, soft shoulder).

(5) A driver should be able to recognize any malfunctions of the steering system such as steering wheel play, hard steering, pulling to one side, shimmy, poor recovery and self-centering, noise, and tire squeal.

b. Shock absorbers lend firm control over spring action, helping to provide directional stability.

(1) Shock absorbers make it possible for tires to maintain a nearly continuous, firm contact with the road surface, producing a smooth and comfortable ride.

(2) Shock absorbers have limited life and lose effectiveness gradually. Worn shock absorbers cause swaying on curves; uncontrolled wheel bounce and bottoming on bumps; excessive rocking and dipping motions when moderate stops are made; vehicle instability at highway speeds.

3.3 *Weight, Speed, and Vehicle Profile*

a. The effects of side wind forces increase as the weight of the car decreases, but a heavy vehicle is not immune to the effects of side wind (danger of sudden shifts of wind direction velocity; also the danger of driving into a head wind and then suddenly turning a corner).

b. Trailers, campers, and vehicles with cartop carriers are especially susceptible to wind forces due to their higher center of gravity.

c. As car speed increases, the angle at which directional changes can be made safely decreases. For example, a lane change at 15 mph can be made at a 45° angle while at 60 mph a smaller angle is required.

3.4 *Backing*

a. In straight backing procedures, the driver should:

(1) on the first attempt, straighten the vehicle; (His left hand is placed on top of the wheel and his right arm on the back of the front seat for better visibility and more comfort.) and

(2) turn the wheel to the side of the road the back of the car is to go and not release the wheel during this maneuver.

b. In backing around corners, the driver should:

(1) steer in the same manner as when going forward, looking back instead of front; and

(2) look over his shoulder in the direction the vehicle is to go.

3.5 *Two-wheeled Vehicles*

a. Small bumps, obstacles in the road, and other surface conditions not even noticed by an automobile driver frequently challenge the two-wheeled vehicle operator. He should:

(1) cross railroad tracks at as near to a 90° angle as possible to avoid skidding and catching the wheels in them;

(2) keep the vehicle as close to vertical as possible on slippery surfaces;

(3) avoid the grease strip in the center of the lane and the bumps along the road edge by driving to the left side of a road lane;

(4) if a small obstacle or bump cannot be avoided, hit it head-on with the handle bars grasped firmly and the body raised slightly from the seat to protect the spine from the jar.

b. Packages should be carried in a saddlebag or a carrying rack, freeing both hands to use the controls and maintain good balance.

Part II On-Highway Tasks
Unit A Basic Control Tasks
Episode 4 Speed Control

EPISODE PRINCIPLE The speed of the vehicle must be adjusted by the driver according to vehicle and personal capabilities, environmental conditions, man-made and physical laws, and the driver's directional objectives.

EPISODE PURPOSE The purpose of this episode is to help the student develop the capability to judge appropriate speeds for road conditions. Special emphasis is placed on speed control on turns and curves.

Concepts	Supporting Principles	Behavioral Objectives
4.1 Source and Transmission of Power	The internal combustion engine provides power via the accelerator pedal.	*Cognitive* Trace the power from its origin in the cylinders to the rear wheels, describing the function of the clutch, transmission, drive shaft, and differential.
4.2 Kinetic Energy	A moving vehicle, just as any other body in motion, possesses what is known as kinetic energy produced by its weight and its velocity.	Apply the concept of kinetic energy to vehicular movement.
4.3 Acceleration	Acceleration, an increase from a given speed or stationary position to a higher speed, depends upon a variety of factors.	Define the term *acceleration* and state the factors that determine the acceleration capability of vehicles.
4.4 Deceleration	Deceleration, a decrease in the rate of speed of the vehicle, can take place through means other than braking.	Define the term *deceleration* and describe non-braking techniques for safely and efficiently decelerating a moving vehicle.
4.5 Cornering	The tendency of a moving body to continue at the same speed and in the same direction unless another force is applied confronts the operator as he strives to maintain directional control during turning movements.	Identify vehicular and environmental factors that determine speed selection on curves.
4.6 Speed Choice	Proper choice of speed is a major tool to be used in coping with highway hazards. As speed increases, the time available for identifying, predicting, deciding, and executing decreases.	Given a series of highway scenes to analyze, identify environmental conditions that indicate a need to evaluate and perhaps alter the rate of movement.
4.7 Speed Laws	Vehicle codes include more than one speed limit.	Classify the various kinds of speed limits. *Affective* Obey the Massachusetts speed laws and apply the identify, predict, decide, execute (IPDE) concept to speed control.

Learning Activities

1. A student places a pound weight on a piece of stretched rubber, and the class notes the give of the rubber. He then ties the weight to the rubber and drops it from the height of a foot. Another student measures the elasticity of the rubber.
2. Discuss the similarities between a dropped weight and a speeding car with relation to force, stopping potential, and need for elasticity. (Perhaps this is a good time to include a discussion of air bags, water filled bumpers, and flexible glass.)
3. A student twirls a weight on the end of a string and then releases the string. Discuss why the weight tends to go straight ahead instead of in a circular motion.
4. A student uses a model racing set to demonstrate the need to slow down at a curve and then to speed up after the curve has been entered.
5. Have each student create a possible traffic incident and conditions making speed changes necessary. Discuss each incident. (Speed laws are not arbitrary laws but are made after careful analysis of weather conditions, hazards, and so forth.)

Evaluation

Cognitive
Labels the parts of the power train shown in a diagram.

Controls the speed of the vehicle permitting adequate speed and stops.

Defines the terms *acceleration* and *deceleration* and lists the factors influencing both.

From a list of environmental factors that determine proper speeds, selects those related to speed on curves.

Using slides of local scenes, points out those conditions that would alter speed.

Selects the type of speed law in force in Massachusetts.

Affective
In the driver education car, adjusts speed to road and vehicle conditions.

Resource Information

4.1 *Source and Transmission of Power*

a. The burning of a gasoline-air mixture in an enclosed space (cylinder) is the source of power.

b. Most vehicles have four, six, or eight cylinder-piston-spark plug combinations each fired at a different moment to provide continuous and smooth power production.

c. Four strokes of the piston represent a cycle repeated many times over (intake, compression, power, and exhaust).

d. A supply of high voltage electricity is supplied to each spark plug in proper order and timing by the distributor in cooperation with other components of the ignition system.

e. When the ignition and starter switch (usually combined) is turned on, the electricity flows from the battery to the small electric starter motor which spins and cranks the gasoline engine.

f. The lubricating and the cooling systems are needed to keep the engine going.

g. Power is transmitted from the engine through the transmission, the drive shaft, and the differential to the car's rear wheels (power-train).

4.2 *Kinetic Energy*

a. The potential energy stored in gasoline is changed to kinetic energy by the car's engine.

b. Kinetic energy keeps the car rolling when the foot is removed from the accelerator, and there is no help from the engine.

c. Kinetic energy increases in a geometric progression — the square of the speed.

d. To stop a moving vehicle, kinetic energy, which cannot be destroyed, must be converted in form to heat by rolling to a stop, braking to a stop, or colliding with an obstacle.

4.3 *Acceleration*

a. Engine power and gear ratio are dominant variables in determining acceleration capability.

b. Other factors influencing acceleration are:

(1) traction of the drive wheels;

(2) driver's selection of proper gear ratio; and

(3) driver's use of the accelerator pedal and related feedback.

c. To accelerate on an upgrade, the engine has to overcome the force of gravity in addition to the usual work of moving the car.

4.4 *Deceleration*

a. When the pressure on the accelerator pedal is decreased, the car slows down due to a retarding force of engine compression, air resistance, and frictional forces between the tires and the road surface and in the moving parts of the engine and power-train.

b. Downshifting (selecting a lower gear ratio in a manual transmission car), in combination with less pressure on the accelerator, produces a sufficient retarding force for control in some situations and also saves brake linings.

c. On a downgrade, the driver can compensate for the pull of gravity by releasing the accelerator, braking or shifting to a lower gear depending upon the degree of slope.

d. Removing the foot from the accelerator suddenly, creates an effect that is similar to applying the brakes, a reality to be considered on slippery surfaces.

4.5 *Cornering*

a. On a curve, the turning of the front wheels is the force applied to change the direction of the vehicle (provides a side thrust).

b. On a curve, friction and the force of gravity combine to help keep the car from skidding off the roadway.

c. Centrifugal effect, a term used to describe the effect of inertia when a car rounds a curve, varies in a geometric ratio — the square of the speed.

(1) Speed, a factor over which the operator has direct control, is the most important variable in controlling a vehicle on a curve because of its dominant influence on centrifugal effect.

(2) As the radius of the turn is reduced, the centrifugal effect is increased and consequently the slower the operator must drive to get around the curve safely.

(3) Centrifugal effect increases directly with the weight of the vehicle; however, an increase in the coefficient of friction due to added weight helps to balance this negative factor.

d. Besides the radius of the curve and the weight of the vehicle, other environmental, vehicular, and operational factors determine the safe speed for curves.

(1) When a vehicle is cornering, the front wheels lead the rear wheels in such a manner that the tracks of the rear wheels are inside those left by the front wheels.

(2) The coefficient of friction between the tires and the road surface is the most significant factor in determining the safest speed on a curve.

(3) Whether the road is banked, flat, or crowned makes a considerable difference in the safe speeds for negotiating a curve. (Crowned roads are banked the wrong way for a left hand turn.)

(4) Properly functioning shock absorbers increase cornering ability as they work with friction and gravity to combat centrifugal force.

(5) The dimensions and weight distribution of a vehicle influence its cornering stability and the ease with which it can be handled on turns and curves.

(6) Proper tire pressure is important for optimum vehicle performance on a curve. Cornering ability tends to improve with the increase of pressure at a constant load because of the increase in side-wall stiffness.

(7) Over steering on a turn generally results from accelerating too soon or failing to return the steering wheel to straight ahead soon enough.

(8) Braking the vehicle after entering the curve tends to play into the hands of inertia and cause the vehicle to plow straight ahead on a tangent to the curve.

(9) If the driver enters a curve below the critical speed (speed at which frictional forces break loose), he can accelerate coming out of the curve.

(10) In determining the safe speed for curves, engineers have considered vehicle and driver capabilities and also the physical forces involved.

4.6 *Speed Choice*

a. Objects and obstructions on or near the intended path of the vehicle (rocks, glass, barricades, fallen, branches, curbs, poles, mailboxes) create a hazard that a driver must reckon with by speed and/or direction adjustment.

b. Accurate speed adjustment is particularly critical on older roads built for cars of the day and frequently inappropriate for the characteristics of modern vehicles. Some examples are:

(1) numerous curves and hills;

(2) narrow lanes and bridges;

(3) low, narrow, and soft shoulders;

(4) many near-road obstacles;

(5) changes in the number of lanes;

(6) poor or no markings;

(7) deteriorating edges; and

(8) chuck holes.

c. Any speed can be excessive.

d. The small amount of time gained by increased speed (80 mph as opposed to 70 mph) does not justify the added risk.

e. A driver's sense of speed, not particularly keen at best, is distorted further under certain conditions (velocitization).

(1) The type of vehicle being driven affects the driver's sense of speed (height of eyes above the road, noise level, and vibration level).

(2) Cars seem to be moving faster when the windows are open.

(3) Sustained high-speed driving tends to dull a driver's judgment of speed.

f. Glancing frequently at the speedometer helps the driver to remain aware of the speed (particularly important on the freeway exit ramps and for a while after leaving the freeway).

4.7 *Speed Laws*

a. Absolute speed limits, both maximum and minimum, serve as a guide to the driver in selecting appropriate speeds for varying conditions.

(1) Persons drive in a variety of environments for the first time and, therefore, need some advice with respect to the selection of a reasonable speed.

(2) Speed is dangerous and, therefore, illegal above or below certain limits.

(3) Maximum speed limits vary with types of vehicles and with times and locations. (p. 20; DLM)

(4) A maximum speed limit does not give the operator permission to go the limit. It merely suggests the speed at which he may travel under ideal conditions.

(5) Speed limits are or should be determined by engineering studies which take natural laws into account.

b. In addition to absolute speed limits, drivers at all times operate under a basic speed law. (p. 21; DLM)

(1) This regulation compels the driver to use good judgment in scaling down the absolute speed limit to fit the conditions prevailing at a given time and place (reasonable and prudent speed).

(2) Although there is less chance the driver will be cited for violating the basic speed law, it is the more important law for him to self-enforce insofar as safety is concerned.

c. Some states include a prima facie speed law which combines features of both the absolute and the basic speed laws.

d. According to research, drivers tend to heed speed advisory signs warning of hazardous situations more than they do regular speed limit signs.

e. Warning signs (diamond shaped) help the driver perceive a hazardous situation, bringing the information to him in advance of the point where he could see it, especially where visibility is limited. (pp. 26-29; DLM)

f. Regulatory signs (rectangular shaped) indicate special laws or regulations. (p. 30; DLM)

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Part II On-Highway Tasks
Unit A Basic Control Tasks
Episode 5 Braking and Stopping

EPISODE PRINCIPLE When speed is constant, braking time and distance vary with brake performance, tires, road surface, and braking technique of the driver.

EPISODE PURPOSE The purpose of this episode is to acquaint the student with man-machine-road interaction with respect to braking and stopping a motor vehicle. In the process, he should acquire the concepts and skills basic to precise and well-timed braking.

Concepts	Supporting Principles	Behavioral Objectives
5.1 Stopping	In order to stop a moving vehicle (a body in motion tends to remain in motion), friction must convert kinetic energy into heat.	*Cognitive* Describe the various ways that kinetic energy can be dissipated to stop a moving vehicle.
5.2 Normal Braking	Braking efficiency is influenced by a number of factors.	Indicate the factors that determine braking efficiency in a normal slowdown and stop.
5.3 Locked Wheel Stop	When brakes are applied too firmly or too suddenly, the friction between the brake lining and the brake drum is so much greater than the friction between the tires and the road surface the wheels stop or lock before the vehicle stops.	Contrast locked-wheel braking versus normal braking with respect to man-machine-road factors.
5.4 Braking Distance	Since kinetic energy which must be changed to heat by braking varies in a geometric progression, so does braking distance. (Double the speed, and braking distance increases four times; triple the speed, and braking distance increases nine times.)	Given certain speeds and coefficients of friction, predict the effect of these variables on braking distance.
5.5 Stopping Distance	Total stopping distance equals the distance a vehicle travels during the time needed by the operator for identification, prediction, decision, and execution plus the time required for the brakes to stop the vehicle after the brake control has been activated.	Given certain speeds and times needed for identifying, predicting, deciding, and executing, estimate the total stopping distances. (Stopping distance is greater than would be expected.)
5.6 Braking Techniques	Proper braking techniques can provide smooth stops, prevent accidents, and also add miles to the life of the brakes.	Relate principles underlying the braking operation to braking techniques.
5.7 Securing the Vehicle	A driver can markedly reduce the chances of his vehicle being stolen.	Identify the measures under the driver's control that can reduce the number of auto thefts.
		Affective Accept the concept that doubling speed does more than double stopping distance.

Learning Activities

1. Determine mathematically the braking distance of a car at certain speeds under ideal road conditions and during rain.
2. Roll a model car or toy car with one wheel locked across the floor showing the instability if only one wheel is braking. Then roll it with all wheels locked to show what happens.
3. Determine mathematically the total stopping distance under good travelling conditions.
4. Relate the concepts in the episode to the principles listed in the Smith System — "Space and Visibility."
5. Give a brake detonator demonstration to a large group.

Evaluation

Cognitive
Lists several ways kinetic energy is dissipated.

Selects from several factors those that effect normal braking distance.

Analyzes differences between locked and normal braking practices.

Describe a driving situation giving the speed of the car, road conditions, and coefficient of friction and braking distance. Given a similar situation with a different coefficient of friction, student predicts braking distance.

Show a chart giving times to IPDE at a slow speed. A higher speed is given and the student supplies times to IPDE and total stopping distance.

Psychomotor
Stops the driver education vehicle in a safe distance and location.

Affective
Does not maintain the same following distance at 40 mph as he does at 20 mph.

Resource Information

5.1 *Stopping*

a. On a level road, a car that is not accelerated eventually rolls to a stop without braking, because the rolling friction between tires and road surface, the friction of the moving parts, air resistance, and the engine compression all help to slow down the vehicle. It stops in a shorter distance going uphill and conversely downhill because of the additional force of gravity.

b. In a normal braking stop, the frictional drag of the brake lining against the brake drums slows the revolving wheels, and the tires transmit the braking force to the road surface.

c. In a locked wheel stop, energy is dissipated through heat generated between the sliding tires and the road surface.

d. In a collision, energy is dissipated when the metal of the vehicle is crushed or bent and from the resistance of the obstacle that it hits.

5.2 *Normal Braking*

a. Wear, grease, and water reduce the efficiency of the brake lining and drum contact points.

b. Liquids cannot be compressed, therefore, hydraulic fluid in brake lines running from a master cylinder to each wheel cylinder transmits pressure as effectively as a steel bar, assuming high quality brake fluid and a tight system.

c. If all four wheels are not braking equally, braking distance for a given speed increases and steering is unpredictable.

d. The front wheels are required to do more work than the rear wheels because of weight transfer.

e. Power brakes assist the driver in applying brake pressure but do not affect the amount of friction or braking force generated.

f. The coefficient of friction between the tires and the road surface governs the maximum braking force usable. The most powerful brakes are useless without traction.

g. Maximum braking force is obtained just before the wheels lock.

5.3 *Locked Wheel Stop*

a. When the wheels lock, the friction between the tires and the road is the major determinant of the length of the stop.

b. The lower the coefficient of friction between the tires and the road, the less effort required to lock the wheels.

c. In a locked wheel stop, heat generated between the tires and the road surface tend to melt tire rubber or ice thus reducing further the coefficient of friction.

d. When the wheels are locked equally, the vehicle tends to slide straight ahead unless acted upon by some other force (wind, side slope or crowned road, curve, or surface variation).

e. When the rear wheels lock while the front wheels run freely, the vehicle is prone to turn completely around (180°) if speed is sufficient. Applying the parking brake too forcefully in an emergency could produce the same result.

f. Locked wheel braking, in effect, takes away steering control.

(1) Rolling friction between tires and road is essential before the direction of the vehicle can be changed by the use of the steering mechanism.

(2) Although steering control is lost in a locked wheel stop, braking distance may not be significantly different, in fact, it may be shorter.

5.4 *Braking Distance*

a. Although braking distance assumes a locked wheel stop, any other braking technique requires approximately the same distance or longer.

b. When speed remains constant, braking distance varies inversely with the coefficient of friction between the tires and the road surface. (When the coefficient of friction is reduced by one half, braking distance is doubled.)

c. Weight of the vehicle does not change braking distance significantly in a locked wheel stop.

d. A vehicle equipped with bald or threadbare tires slides considerably farther on a wet surface than the same car equipped with tires having good tread. (Bald tires have relatively good stopping ability on a dry surface.)

5.5 *Stopping Distance*

a. Feet per second serve as a basis for determining distance travelled in a given time. To convert miles per hour to feet per second multiply the miles per hour by 1.47.

b. Distance travelled in feet per second during the IPDE functions varies directly with the time. Distance equals time multiplied by velocity.

c. Identification, prediction, and decision-making times vary widely with the complexity of the circumstances and the capability of the driver. They may vary from a fraction of a second when a red light suddenly appears to a few seconds in a highly discriminative situation.

d. Execution time varies between individuals due to muscular coordination and skill. It also varies for the same individual under different conditions (fatigue, alcohol, drugs). Covering the brake pedal (foot poised on brake) when uncertain conditions lie ahead, reduces execution time if braking becomes necessary.

5.6 *Braking Techniques*

a. Braking technique becomes more critical as vehicle speed increases.

b. For efficient braking, foot pressure should conform with the speed, using minimum pressure to stop in the required distance or time.

c. Releasing the brake pedal slightly just prior to the stopping point, permits the vehicle to level and prevents a snap-back effect.

d. A slight pumping action of the brake pedal tests the proper functioning of brakes, checks the traction between the tires and the road surface, and provides a brake light warning to following traffic.

e. When compelled to stop quickly, particularly on a wet or icy surface, intermittent application of the brake pedal (pumping action) minimizes the danger of skidding and helps the driver maintain steering control. The up-phase permits the tires to roll. (p. 36; DLM)

f. When continuous braking is required for a period of time (long, steep downgrade), shifting to a lower gear before starting down provides engine braking power, takes some of the strain off brake linings, and helps to prevent brake fadeout. (p. 36; DLM)

(1) Some automatic transmissions do not downshift above a certain speed.

(2) Light, smooth braking on a long downgrade is often preferred to pumping, since the up-phase in pumping permits the vehicle to accelerate.

g. Although most of the basic concepts related to braking an automobile (friction, locked wheel braking, and braking distance) also apply with slight modification to a two-wheeled vehicle, braking technique is different because of the different braking systems in two-and four-wheel vehicles.

5.7 *Securing the Vehicle*

a. Professional automobile theft rings do operate, but the professionals are out-numbered by young amateurs who feel like joy-riding.

b. Drivers who tempt car thieves by leaving keys in the car or the doors unlocked are actually promoting accidents, because a disproportionate number of stolen cars are involved in accidents (many involving police pursuit).

c. Every driver pays a price for car theft — even if his car in not stolen — through increased insurance premiums and increased risks on the highway.

d. To reduce the chances of his car being stolen a driver should:

(1) always remove the ignition key;

(2) lock the doors and close the windows;

(3) not attract potential thieves by leaving valuable items exposed in the car; and

(4) try to park in an area that is well lighted.

e. Manufacturers are installing anti-theft devices on automobiles.

Part II On-Highway Tasks
Unit B Interacting With Highway Environment
Episode 1 Movement Within Traffic Flow

EPISODE PRINCIPLE Except at intersections and merging locations the operator's sub-tasks of interacting with other highway users relate mostly to vehicles in front and in back of his vehicle.

EPISODE PURPOSE This episode relates the human functions involved in operating a motor vehicle to specific fore and aft relationships with other highway users. Emphasis is placed on strategy to avoid conflict or turbulence within the traffic flow, but evasive actions are also presented.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Following Preceding Vehicle(s)	To be prepared for unexpected moves by the vehicle(s) in front of him, a driver must maintain proper following distance and watch for conditions which can cause him to slow down or stop.	*Cognitive* Given a series of traffic situations involving fore and aft relationships, identify relevant cues and select measures under operator's control that will reduce the probability of conflict with other highway users. These situations should include freeway approach ramps and acceleration and deceleration lanes.
1.2 Being Followed by Another Vehicle	To some extent the operator is at the mercy of the drivers following, but there are some measures under his control which can reduce the probability of conflict.	
1.3 Meeting an Oncoming Vehicle	Meeting an oncoming vehicle, particularly on a two-lane road, is potentially the most hazardous situation in driving.	
1.4 Passing and Being Passed	Safe and efficient passing hinges upon good judgment plus a systematic pattern of action.	Describe the correct step-by-step process for passing another vehicle going in the same direction, including the rationale for each step. *Affective* When passing a vehicle, select a distance and location which permits an adequate cushion of space.

Learning Activities

1. To trigger class discussion, show the students scenes from films covering following distances, oncoming traffic, and passing another vehicle. The entire film should not be shown.
2. Suggest a minimum number of critical steps necessary for passing another vehicle and illustrate when each occurs. Students then explore the considerations that need to be given between and with each step. Massachusetts motor vehicle rules and regulations for the passing maneuver should be considered at this time.
3. In the driver education cars, have the students practice passing each other in an area relatively free of other vehicles. Each student should have an opportunity to pass another vehicle.
4. List the three questions the driver should ask himself each time he decides to pass another vehicle. (1) Is it necessary? (2) Is it legal? (3) Is it safe? Use local situations to illustrate considerations for each question.

Evaluation

Cognitive

Test students as suggested in the episode behavioral objectives.

An evaluation checklist can be used in the driver education vehicle to record driver application of concepts.

Affective

Drives at a proper following distance in the driver education vehicle.

Resource Information

1.1 *Following Preceding Vehicle(s)*

a. To adjust for fluctuations in the speed of traffic ahead without sharp braking or acceleration, the operator should allow his reaction time distance plus a generous margin of safety. (p. 45; DLM)

(1) Braking distance may exceed the braking distance of the vehicle in front.

(2) If the preceding vehicle hits something, it may stop far short of the braking distance.

(3) Lightweight motorbikes can be stopped in a shorter distance than an automobile going 25-30 mph, so following distance should be increased. In addition, motorbikes and motorcycles can topple during an emergency stop or after striking an object on the roadway.

b. A much wider margin of safety should be allowed when travelling at high speed, at night, and on slippery surfaces.

(1) On freeways there is virtually no such thing as a minor rear-end collision.

(2) Braking distance is more unpredictable on slippery surfaces. (p. 36; DLM)

(3) It is more difficult at night to detect conditions ahead which can cause preceding vehicles to reduce speed suddenly.

c. Driving too closely to the vehicle in front can create problems.

(1) A driver must work harder to keep his vehicle in its lane, because he is tracking on the vehicle ahead rather than on a point down the road.

(2) His speed control is erratic as he tries to judge and adjust his distance behind the vehicle ahead.

(3) His view of conditions ahead and to the sides (escape route) is limited.

d. When proper following distance is maintained, a driver occasionally encounters the annoying problem of the compulsive gap-filler. On such occasions the driver should:

(1) simply drop back and re-open a space for his own protection;

(2) avoid competing with the intruder;

(3) realize that little time is lost even though this happens a number of times on a given trip; and

(4) help to preserve a safe gap ahead of his vehicle by making sure that, while adequate, it is not too big nor inviting especially in heavy traffic.

e. By keeping alert and anticipating slow-downs or stops ahead, a driver rarely needs to use all his space cushion or resort to a screeching, lurching, panic stop. Some warning clues are:

(1) a traffic light that was green for a long time (stale green);

(2) a vehicle preparing to turn;

(3) a driver trying to force his way into another lane;

(4) children playing near the road;

(5) a person getting out of a parked car on the street side; and

(6) a street repair job that is causing a bottleneck.

f. At higher speeds, a driver tends to underestimate the rate of closure between his vehicle and the preceding vehicle (particularly dangerous in the case of a farm vehicle ahead).

g. During freeway driving, he should be prepared to adjust his speed and lane position to assist other vehicles as they enter and leave the freeway. If there are many entrances and exits, it may be better to drive in the second lane from the right.

h. By placing headlights on low beam at night, he avoids blinding the driver of the preceding vehicle (a law in some states).

i. The driver of a motorbike should position his vehicle so that it can be seen in the rear view mirror of the driver in front.

1.2 *Being Followed by Another Vehicle*

When being followed by a vehicle, the driver should:

a. Dispose of a tailgater by accelerating, decelerating, or moving into a slower lane.

b. Avoid sudden or needless stops by being alert to conditions ahead.

c. Flash stoplights by pumping the brake pedal and using a vigorous arm signal to warn an overtaking operator.

d. Turn off a road as quickly as circumstances permit, especially on left turns.

e. Make certain that tail lights, stop lights, and turn signals are working properly.

f. Avoid slowing or stopping not required by traffic conditions.

(1) An operator doing 35 mph in a stream of vehicles moving at 60 mph, *relatively*, is driving at 25 mph directly against the flow of traffic in his own lane.

(2) Again, *relatively*, he is backing up at that speed without looking in that direction.

g. Signal well in advance of turning, and turn from the proper lane.

h. Never stop on the highway. (If he misses a turn, he should continue to the next turn-off.)

i. Change lanes only after he:

(1) checks the rearview mirrors to see if a safe gap is open, or soon will be open, in the lane where he intends to go;

(2) uses turn signal and gives the operators concerned with his turn time to perceive the signal;

(3) takes a quick but adequate glance over his shoulder on the side he intends to turn to cover the blind spot; and

(4) assuming all-clear ahead, moves promptly into the desired lane and stabilize his vehicle.

j. Use techniques similar to those used in lane changing on freeway approach ramps and acceleration lanes.

(1) Evaluate the location and speed of vehicles on the freeway and also any vehicles in front of him on the ramp or acceleration lane. Since the rearview mirror does not give the full picture, he should use short, quick glances over his shoulder.

(2) Tentatively select a gap in traffic that permits him to enter the freeway.

(3) Build up speed to coincide closely with traffic flow.

(4) Merge smoothly with the outside lane as lane markings and traffic permit.

(5) Build up freeway speed as quickly and safely as possible to avoid congestion.

k. When preparing to leave a freeway: (p. 39; DLM)

(1) signal early;

(2) position his car to the right of his lane;

(3) flash brake lights if traffic is closing in at a high rate of speed;

(4) avoid slowing down too much while still on a through lane, but quickly conform to advisory speeds for the ramp;

(5) drive to the next exit regardless of the distance if he misses his freeway exit; and

(6) return to the freeway at an entrance point if he turns off at the wrong exit.

1.3 *Meeting an Oncoming Vehicle*

a. An oncoming operator may cross the center line into the intended path of another driver as a result of:

(1) momentary distraction;

(2) recovery from a pavement drop-off;

(3) blinding rain, snow, fog, dust, or smoke;

(4) poor judgment in passing;

(5) swerving to miss a bicycle rider, a pedestrian, a road defect, or obstruction;

(6) making a turn;

(7) excessive speed or lack of control on a curve;

(8) falling asleep; or

(9) alcohol or drugs.

b. To reduce the risk of meeting an oncoming vehicle the driver should:

(1) keep as far from the center line as practical, and on four-lane roads generally use the outside lane;

(2) constantly check the action of oncoming traffic to be prepared to take evasive action if someone misjudges and comes into his lane;

(3) avoid relying on the turn signals of the approaching car;

(4) reduce speed on older roads and bridges;

(5) always use headlights, not parking lights, when lights are called for;

(6) switch to low-beam headlights and reduce speed on two-lane roads at night;

(7) flick lights up and down to signal an oncoming driver that his high beam is blinding, but then use the low beam whether he does or not;

(8) check lights for aiming correction if other drivers keep signalling their objections to glare from his headlights even when on low beam; (A heavy load in the trunk can raise the headlights.)

(9) condition his mind to the possibility of a vehicle coming across the center line into his path by examining the shoulder and adjacent area and planning an escape route; and

(10) actually practice evasive steering at lower speeds.

c. A driver should avoid a head-on collision at all costs. If an oncoming vehicle does pull into his lane, he should:

(1) brake immediately but carefully to avoid wheel lock-up, blast his horn, and dodge to the right (onto the shoulder, into a ditch, or into any gap that he can create in the line of cars on the right); and

(2) if necessary, come into conflict with vehicles in the right-hand lane to reduce the impact of a head-on collision to sideswiping.

1.4 *Passing and Being Passed*

a. By staying well back of the vehicle to be passed, the operator is in a better position to:

(1) check the variables ahead which affect his decisions;

(2) accelerate and quickly gain a sufficient superiority of speed when the way is clear; and

(3) stabilize his vehicle in the passing lane before drawing abreast of another car.

b. Pavement markings and signs aid the operator in making a passing decision, but he must search for additional information before deciding whether this crucial maneuver is worthwhile, legal, and safe. (pp. 17, 18, 31; DLM)

(1) Grades (vertical curves) on undulating roads were built for cars a foot or two higher, making it difficult to see modern cars in the dips.

(2) The size and color of oncoming vehicles influence the distance judgment of the perceiver.

(3) The operator's view is obstructed if he follows another car as it passes. In addition, there may not be sufficient space for him to return to the right lane.

c. If the operator communicates his intention to pass (horn or lights), he reduces the chance that the car being passed will swerve into his lane.

(1) Passing should be avoided if the operator ahead is about to pass a pedestrian, cyclist, animal, or anything which could cause him to swerve suddenly.

(2) Driving alongside in the blind spots of the other driver longer than necessary should be avoided.

d. If the operator withholds his final decision to complete the passing maneuver until he is in the passing lane near the vehicle being passed, he has more time to assess the situation ahead and also be better prepared mentally to brake and pull back into the right lane should an obstacle appear in the path ahead.

(1) His decision is tentative until that point.

(2) However, the operator should proceed to the point of final decision as if he were going to complete the pass.

e. If for any reason the vehicle being passed demonstrates erratic behavior before the point of decision is reached, the driver should drop back into the right lane and re-evaluate the situation.

f. By building up a clear superiority of speed over the vehicle being passed, the operator minimizes the time he is exposed in the passing lane.

(1) A 15 mph superiority means approximately 8 seconds in the passing lane.

(2) The time required for passing when 15 mph superiority has been built up is the same regardless of the speeds of the two vehicles, but the distance used in passing increases as the speed increases.

(3) Almost one-half mile is needed to make a safe pass at 65 mph if another vehicle is coming from the opposite direction at the same speed.

(4) More time is required to pass a truck, bus, or trailer.

(5) Because of air resistance and a reduction of power available at the rear wheels, it takes longer to accelerate and pass at high speeds. Since acceleration power decreases as speed increases, it takes longer to accelerate from 60 mph to 70 mph than it does from 50 mph to 60 mph. This is true of every car, but each car has a variable rate of acceleration.

g. Remaining in the passing lane until the front of the car being passed appears in the rear view mirror, assures the driver that he can return to the right lane without cutting off the passed vehicle.

(1) A brief glance over the right shoulder is a good habit to develop, particularly in congested, urban areas.

(2) The operator being passed should be allowed the proper following distance.

h. The same key passing rules apply on four-lane undivided highways as on two-lane rural highways except:

(1) the passing differential in speed is not as crucial as it is on a two-lane highway;

(2) instead of judging the pass to reduce expo-

sure in the passing lane, a steady speed is necessary for flowing and blending with the traffic; and

(3) passing on the right is permitted. (See State laws.)

i. In a passing situation, if a driver misjudges the speed and distance of an oncoming car, he should:

(1) try to brake and fall back in behind the vehicle he intended to pass, or

(2) accelerate and return to his lane ahead of the vehicle he is passing;

(3) avoid swerving off to the left when an oncoming vehicle is close because that is the other driver's escape route.

j. When being passed, a driver should maintain an even speed. If the operator passing misjudges the distance of an oncoming vehicle, however, the one being passed may be compelled either to:

(1) accelerate and let the passer drop back into his lane, making certain that this is his intent; or

(2) decelerate, poise foot on brake, and look for an escape route if needed.

Part II On-Highway Tasks
Unit B Interacting With Highway Environment
Episode 2 Intersections

EPISODE PRINCIPLE The chances for conflict with other highway users are markedly increased at intersections.

EPISODE PURPOSE A large number of traffic accidents occur at various types of intersections where two or more traffic flows mix. To avoid conflict and negotiate intersections safely, vehicle operators must apply all their mental and physical skills promptly and precisely. The episode is directed to this end.

Concepts	Supporting Principles	Behavioral Objectives
		Cognitive
2.1 Approach	When approaching an intersection, special considerations and checks facilitate safe and efficient progress for the operator.	When shown approach positions to various kinds of intersections, identify and appraise relevant cues and state effective means of handling the situations.
2.2 Turning Movements	A competent operator is marked by his ability to make well-timed and accurate turning movements at intersections.	Given a series of diagrams or pictures of various kinds of intersections, describe how to execute turning movements. Descriptions should include lane and speed choices and communication techniques.
2.3 Railroad Crossings	Through an understanding of the hazards involved and heeding certain elementary but crucial precautions, operators can safely cross train-car intersections.	Explain the mental errors committed by vehicle operators causing railroad crossing accidents and how these errors can be overcome. In addition, describe the proper steps to follow if a car stalls on the railroad tracks.
		Affective Yield the right-of-way to other highway users when it is unsafe to maintain it.

Learning Activities	Evaluation
1. The students should have opportunity to apply the concepts in this episode in the vehicle soon after class discussion. 2. Show slides of grade crossings in the community for the class to analyze. Questions worthy of exploration with each slide may be: What driver errors at this crossing may result in an accident? What special dangers does this crossing present? 3. Have a student observe traffic at two intersections for 15 minutes each and list driver errors observed. The class can develop conclusions based upon the facts gathered.	*Cognitive* Using slides of local street and street intersections and street and railroad intersections, student describes how the situation should be handled. Lists mental errors drivers most often commit at railroad crossings and tells how errors can be avoided. In a simulated situation during laboratory experience, student demonstrates what he would do if he stalled on a railroad track. *Affective* Applies principles of negotiating intersections in the driver education vehicle.

Resource Information

2.1 *Approach*

a. An intersection is not always defined by signs or traffic signals; for example, factory parking lots and shopping center entrances and exits often create hidden intersections in the middle of the block. Rural intersections may reveal themselves through crossing or turning cars; rows of houses, trees, fences, or telephone lines; and signs.

b. An initial scanning of the intersection and traffic to the rear serves to identify those elements affecting decisions and presenting potential hazards (traffic controls, impediments to vision, pedestrians).

c. An appropriate approach speed — one that is sufficiently low to permit the driver to stop short of the intersection should conditions warrant — depends largely on the traffic controls, traffic volume, and how much sight distance the driver has in relation to the intersecting street.

(1) The shorter the unobstructed view of the crossroad, the lower the safe speed for approaching the intersection.

(2) When view is obstructed, speed should be reduced so that the point of decision can be withheld until sight distance is adequate.

(3) A typical slow down and look approach to an uncontrolled intersection requires only a few seconds.

d. To negotiate a signalized or signed intersection, operators must apply additional knowledge and skill.

(1) The mere presence of a traffic signal or a sign is a warning of a danger zone, regardless of the color of the light.

(2) Occasionally, an operator who attempts to beat the light or one who simply fails to see the light is encountered.

(3) If an operator has stopped for a red signal and it changes to green, he is still required to yield to other vehicles and pedestrians lawfully within the intersection or in an adjacent crosswalk at the time the green light is exhibited. (p. 24; DLM)

(4) Extra caution should be exercised as a stale green light is approached.

(5) Covering the brake (foot poised on the brake) as an intersection is approached, minimizes execution time distance.

(6) Watching the speed, the signals well ahead, and other cues helps the operator to pace himself with the signals' timing, especially if it is a progressive system.

(7) The operator approaching a yield sign should slow down or stop and yield the right-of-way to any vehicle in the intersection or approaching on another highway so closely as to constitute an immediate hazard. He should continue to brake as at a stop sign until he is certain there is no need to stop. (p. 25; DLM)

(8) The operator approaching a stop sign should stop and yield the right-of-way to any vehicle which has entered the intersection or which is approaching so closely as to constitute an immediate hazard. (A stop sign tells the driver that he must stop but does not necessarily tell him exactly where to stop.)

(9) A flashing red light has the same meaning as a stop sign; a flashing yellow light the same as a slow or caution sign. (Slow down and be prepared to stop.) (pp. 24, 25; DLM)

(10) A green light permits the operator to proceed if the way is clear, but it does not assure safe passage through the intersection.

(11) When a traffic officer is on duty at a signalized intersection, his directions take precedence over the lights.

e. A careful check to the left, straight ahead, to the right, and left again furnishes the operator with the information needed to make a final decision about passing through an intersection. (Each intersection is different and may require a different search pattern.)

2.2 *Turning Movements*

a. A driver communicates his intention to turn by positioning his vehicle in the appropriate lane and flashing his turn signal. (p. 19; DLM)

(1) The proper approach lane for an intersection turn, unless otherwise marked, is the one closest to the direction of the turn. This blocks anyone from trying to pass on the side toward which the driver is turning.

(2) In situations where the operator suspects that those following or approaching do not see the turn flasher because of bright sunlight or inattention, he uses an arm signal, also. (p. 19; DLM)

(3) If turn signals are flicked on prematurely, other operators may be confused.

b. At a signalized intersection it may be appropriate to enter the intersection and wait for a safe gap in traffic to complete a left turn movement.

c. Keeping the wheels straight while waiting to make a left turn, minimizes the chances of being driven into the lane of oncoming traffic if struck from the rear.

d. Entering the crossroad close to a right angle when making a left turn at a "Y" intersection, improves vision and reduces the time the vehicle is in a vulnerable position during the turning process.

e. The driver waits to make a turn onto a main highway until he has space and time to gain cruising speed without interfering with the progress of other vehicles.

f. He can reduce conflict at intersections by turning into the first lane going in the desired direction. Traffic engineers sometimes modify this principle to meet local conditions.

2.3 *Railroad Crossings* (p. 25; DLM)

a. Operators should consider that:

(1) most railroad crossing accidents result in fatalities;

(2) a train gives the illusion of going slower than it is actually travelling;

(3) by the time an engineer realizes a car is in the way, it is already impossible for him to stop; (A full emergency stop from 60 mph takes 1 ½ miles.)

(4) in a large percentage of railroad crossing accidents, the vehicle runs into the side of the train, because the operator was overdriving his vision and perception; and

(5) taking familiar crossings for granted and assuming that no train is coming can be fatal.

b. To move safely through a vehicle-train intersection, the driver should:

(1) make certain the engine is thoroughly warmed up before attempting to cross the tracks;

(2) identify and obey warning signs, signals, and protective devices;

(3) look and listen for approaching trains (reduce the radio volume, crank down the side window, and stop the conversation);

(4) stop a safe distance from the nearest rail if a train is approaching close enough to constitute a hazard, or if the warning signals or gates are operating;

(5) wait for a train to clear a sufficient distance to insure good visibility because another train may be coming from the same direction or from the opposite direction on an adjacent track;

(6) drive onto railroad tracks only when he is certain that he has sufficient speed for the momentum to carry the car past the tracks should the engine fail; and

(7) make certain that no other vehicle in front can prevent his uninterrupted crossing.

c. If in spite of all these precautions the vehicle stalls on the tracks, the driver should:

(1) immediately get everyone except himself out of and well away from the car;

(2) if a train is in sight, get out and leave the tracks in the direction from which the train is coming to avoid being struck by fragments;

(3) if no train is in view, try to start the engine, checking every few seconds to make sure that a train is not coming (not if the tracks curve out of sight for less than one half mile); and

(4) if the vehicle fails to start, try to push it off the track. In a manual transmission, he should put it in low gear and use the starter.

Part II On-Highway Tasks

Unit B Interacting With Highway Environment

Episode 3 Parking

EPISODE PRINCIPLE Proficiency in parking increases a driver's safety and mobility.

EPISODE PURPOSE This episode deals with the laws, principles, and procedures for parallel and angle parking. Not all students will become highly skilled in this subtask, but they will acquire a foundation for raising their proficiency level.

Concepts	Supporting Principles	Behavioral Objectives
		Cognitive
3.1 Selecting a Parking Space	Searching for a parking space places a heavy burden on the driver's perceptual capability.	Identify a legal and appropriate (size) parking space without endangering or delaying other highway users.
3.2 Parallel Parking	Parallel parking is a much used skill. If it is not mastered, it can cause frustration, loss of time, and danger to the driver trying to park and to those behind him.	Describe and execute the procedures for parallel parking.
3.3 Angle Parking	Angle parking tends to impede traffic flow and is therefore found mostly in off-street areas.	Describe and execute the procedures for angle parking.
		Affective
		Select a parking space that will not inconvenience others.

Learning Activities	Evaluation
1. As a homework assignment, have the students use the vehicle code, textbook, and other aids to learn the laws and procedures for this episode. 2. Have the students practice parking on both sides of an off-street area before going on the public streets for practice. If no off-street area is available, initial practice should take place in a residential area. It is not necessary to find a space between two cars. One car will suffice for early practice.	*Cognitive* Talks through the procedures for parallel and angle parking. *Psychomotor* Finds an appropriate parking space and demonstrates at least minimum level proficiency in approaching, entering, and leaving the space (parallel, angle, and hill parking). *Affective* Demonstrates a concern for other highway users by doing everything possible to reduce the inconvenience caused by the parking maneuver.

Resource Information

3.1 *Selecting a Parking Space*

a. When searching for a parking space, the operator should minimize interference to following traffic by:

(1) maintaining close to posted speed;

(2) signalling deceleration or stop to following vehicles when a space is identified; and

(3) if lanes permit, signalling following traffic to pass before attempting to park.

b. He should observe parking restrictions as specified by Massachusetts law and city ordinances.

c. Passengers can be helpful in searching for a suitable parking space.

d. The driver should evaluate the size of the parking space.

(1) Space should exceed one and one-half car lengths for parallel parking.

(2) Space should be wide enough in angle parking to allow vehicle occupants to exit easily.

3.2 *Parallel Parking*

When parallel parking, the driver should:

a. On the approach, use the lane nearest the parking space and pump brakes to indicate a stop.

b. Stop parallel to and 2-3 feet from the car in front of the space, shift to reverse, and prepare to use proper entry procedures (teacher preference).

c. Remember when backing and turning into the space that the front end swings toward the traffic.

d. Center the car in the parking space not more than a foot from the curb. (In some cases, parking lines alter this position.)

e. If parked on an upgrade, turn the wheels sharply away from the curb; if on a downgrade, turn the wheels sharply toward curb; and in the absence of a curb, turn the wheels toward roadside.

f. Use exit procedures similar to those used in lane changing. A greater interval in traffic is needed, however, because of the stationary start.

3.3 *Angle Parking*

When angle parking, the driver should:

a. Be aware that the degree of angle affects the distance the car must be from the parked cars on the approach.

b. Maintain a straight ahead position in the approach lane until the front of his vehicle clears the near parked vehicle.

c. At a slow speed, make a hard right into the space, checking the left front and the right rear of his vehicle for clearance.

d. Proceed forward, centering the vehicle in the parking space and stopping just short of the curb. (Some teachers allow students to nudge the curb.)

e. Get out of the car cautiously in order to avoid striking other cars.

f. When leaving an angle parking space, back slowly to a point where he has adequate sight distance.

g. Back into the first lane, checking the left front fender for clearance with brief glances. (Remember that he is backing against traffic.)

Part II On-Highway Tasks
Unit B Interacting With Highway Environment
Episode 4 Pedestrians and Animals

EPISODE PRINCIPLE Motorists have the responsibility of taking proper precautions to avoid hitting pedestrians even if they jaywalk.

EPISODE PURPOSE The majority of urban traffic fatalities occur to pedestrians. This is so, not because the number of vehicle-pedestrian accidents exceed the vehicle-vehicle collisions, but rather because vehicle-pedestrian accidents are more likely to be fatal. Pedestrians are highly vulnerable. Since accident facts indicate that animals along the highway present drivers with a problem similar to the pedestrian problem (both pedestrians and animals are maneuverable and unpredictable), the animal problem is also dealt with in this episode.

Concepts	Supporting Principles	Behavioral Objectives
4.1 Crosswalks and Laws	Because he is so vulnerable, the pedestrian has been given the right-of-way over the vehicle at all intersections and at any other point at which a crosswalk has been placed across a street. In fact, under no circumstances is the operator of a motor vehicle privileged to exercise the right-of-way over a pedestrian.	*Cognitive* Identify marked and unmarked crosswalks and state the implications they have for driver and pedestrian behavior.
4.2 Types of Pedestrians	To predict pedestrian behavior, the operator must consider how a pedestrian looks at vehicular traffic. Pedestrian actions vary with the individual and change with the age of the person.	When shown pictures or given descriptions of pedestrians in traffic scenes, classify pedestrian actions typical of various age groups.
4.3 Critical Areas	Operators should be especially alert for pedestrians.	Identify the places or conditions which are particularly critical as far as vehicle-operator-pedestrian interaction is concerned and select appropriate courses of action from given alternatives to minimize the hazard.
4.4 Pedestrian Responsibilities	Although the pedestrian has been granted certain protective privileges, he bears certain legal and moral responsibilities in traffic.	Describe the legal and moral responsibilities of pedestrians.
4.5 Animals	If an operator is alert, he can adjust his speed accordingly to avoid colliding with an animal.	Indicate why and where animals can be dangerous to the vehicle operator and what can be done to minimize these dangers. *Affective* Cooperate with pedestrians and animals as other highway system users.

Learning Activities

1. Using a traffic board, illustrate to the class various types of marked and unmarked crossings. Discuss how, why, and where these crossings are laid out and what laws govern their use. Using the same format, discuss intersections where the crossings are not marked.
2. Have the students take part in a buzz session. After dividing the class into groups and designating a leader for each group, present each group with a picture of a particular type of pedestrian in a traffic scene. For a period of ten minutes the students discuss and list those patterns of behavior they believe to be typical of the group illustrated. The pictures should include old people, small children, school children, teen-agers, adults, delivery men, or any other type common to the community. At the end of the ten minutes, the leaders present the findings to the class.
3. Secure an accident spot map from the local police or highway department and study pedestrian accidents that have occurred in the community over a given period of time. List the places where the accidents most frequently occurred, the hours, their causes, and the ages of the persons involved. Note how many of these accidents were due to pedestrian violations. Ask students for suggestions to correct these violations, or have them develop a spot map of their own.
4. Discuss the hazards that various types of animals may present to the motorist. Emphasize how to be prepared for these dangers and how to cope with them when they occur.

Evaluation

Cognitive

Prepare a set of 35 mm slides of driving situations involving pedestrians and animals. Show each slide for 10 seconds. Student names the influences that might affect the driving task and suggests appropriate reactions to the situations.

Resource Information

4.1 *Crosswalks and Laws*

a. Usually, intersection crosswalks are marked, but even if they are not, a pedestrian has the right-of-way from curb to curb. (The crosswalk in the extension of the sidewalk at the intersection.) (pp. 24, 32; DLM)

b. Marked crosswalks may be designated where they are needed.

c. Pedestrians on a crosswalk (unless walking against a red light) have the right-of-way over vehicles. (p. 33; DLM)

d. Crosswalks give the pedestrian more protection in some states than in others. One state's appeal court ruled: "The pedestrian is entitled to as much space as will afford him safe passage without such threat of interference that will reasonably cause him to step back or hesitate."

4.2 *Types of Pedestrians*

a. Since the pedestrian does not need to comply with a licensing law or meet an age regulation, people of all kinds and ages walk on the streets and highways.

b. Many pedestrians are non-drivers (older people and children), but practically all drivers are pedestrians.

c. It can be assumed children, old people, non-drivers, or anyone impaired by alcohol or drugs may have deficient judgment.

d. Elderly pedestrians tend to base their judgments on when to cross on the movement of other pedestrians and vehicles rather than on traffic signals.

e. The speed of an oncoming vehicle (closure rate) is difficult to judge even for a pedestrian with perfect eyesight and excellent depth perception.

4.3 *Critical Areas*

Operators should be especially alert for pedestrians:

a. Around schools, churches, parks and playgrounds.

b. On or near the road (children playing).

c. At intersections and in mid-block locations with department stores on opposite sides of the street.

d. Anywhere near a school bus.

e. Almost anywhere after dark.

f. Near military installations.

g. While passing parallel parked vehicles and delivery trucks (possibility of people alighting from these vehicles).

h. Along any road bordered by a solid fence, buildings, or bushes.

i. On school and college campuses.

j. Whenever people are on foot near the road.

k. Whenever the weather is bad (wind, cold, rain, and snow).

4.4 *Pedestrian Responsibilities*

a. The pedestrian is expected to cross city streets at crosswalks if a hazard is created by doing otherwise.

b. At signal controlled intersections, the pedestrian is required to obey the "walk" and "do not walk" signals. (p. 24; DLM)

c. The law forbids the pedestrian to leave the curb suddenly and walk into the path of a car causing a hazard.

d. If the pedestrian has to walk on a country road at night he should:

(1) stay off the travelled portion of the highway;

(2) walk toward oncoming cars so he can see them;

(3) wear or carry something of a light color (below the waist because of headlights) so drivers can see him; and,

(4) preferably, carry a light.

e. While a pedestrian is subject to certain laws, they are rarely enforced in most cities. (Pedestrian violations have low priority.)

4.5 *Animals* (p. 16; DLM)

a. Knowing the habits of deer helps reduce the numerous vehicle-deer accidents. (Well over 100,000 deer are killed annually by vehicles.)

(1) Normal daily movements of deer include crossing highways. (The driver should heed deer crossing signs by reducing speed.)

(2) Deer feed near roads chiefly during the hours of darkness. (The road shoulder normally offers highly palatable grasses and legumes.)

(3) The presence of one deer often indicates that more are in the vicinity.

(4) The shadow behind the animal created by the headlight is believed to startle the deer when it

moves causing it to bolt into the path of the vehicle.

(5) Many deer will change direction and run back across the road when confused. They usually retreat in the direction they came from.

b. Observation, speed reduction, and readiness are the most effective responses for the driver when an animal threatens his path.

(1) Operators should watch for dogs and cats along the roadside and adjust speed and position to minimize the threat.

(2) At night, the reflective eyes of an animal warn the operator of its presence.

c. Some dogs enjoy chasing motor vehicles. (An operator can usually escape successfully by speeding up.)

Part II On-Highway Tasks

Unit B Interacting With Highway Environment

Episode 5 Impediments to Vision

EPISODE PRINCIPLE Although impediments to vision handicap the operator under any circumstances, they are especially hazardous where he interacts with highway environmental factors.

EPISODE PURPOSE Impediments to vision are one of the worst handicaps to the successful performance of the driving task. Before a driver can identify, predict, decide, and act upon a stimulus, the stimulus must be observed. In this episode, vision problems are brought to the attention of the student for the purpose of increasing his recognition and adjustment capability. Special emphasis is placed on the implications these visual handicaps have for vehicle positioning and speed selection.

Concepts	Supporting Principles	Behavioral Objectives
5.1 Clean Windshield and Windows	If a driver fails to maintain clean windshields and car windows both inside and out, he limits his ability to identify relevant cues in the traffic scene.	*Cognitive* List the impediments to vision caused by dirty or foggy car windows and describe measures under the driver's control to prevent or compensate for these conditions.
5.2 View Obstructions	View obstructions are always present in driving. However, the unnecessary ones should be eliminated and the others adjusted for by the operator.	Given a series of traffic situations (slides or diagrams), identify the obstruction and select appropriate measures to compensate for the situation.
5.3 Climatic Conditions	Weather conditions may reduce visibility thereby adding the limitations of nighttime driving to a daytime situation or compound the normal visibility problems associated with driving at night.	Illustrate the similarity of various climatic conditions and darkness with respect to vision problems.
5.4 Night Conditions	Due primarily to reduced visibility, critical phases of the operator's task are more difficult under nighttime driving conditions. The competent operator adjusts for these differences.	Classify the visual handicaps imposed by darkness and describe compensatory measures at the operator's disposal.
		Affective Advocate the use of open window and defroster to clear steamed-up windows.

Learning Activities

1. Illustrate a dirty or foggy window by rubbing chalk on the chalkboard. Then use an eraser to show how the window can be made clear again. Correlate this demonstration to the use of windshield wipers, washer, scrapper, and defroster in the car.
2. Have the class select five view obstructions they think may be hazardous to driving and tell how to compensate for each situation.
3. Mount a bright spotlight in the center of the chalkboard. With the room darkened, write something on the chalkboard directly under the spotlight. On the count of three turn on the spotlight for one second. Then check to see how many students were able to read what was written on the board.

Evaluation

Cognitive

Given a list of several visual impediments, the student indicates which are caused by dirty windows. Selecting three, he describes how to prevent the impediment from occurring.

Using slides (taken from within a car) showing various obstructions, the student lists obstructions and tells how to compensate for each.

Lists similar visual problems created by climatic conditions and darkness.

Using the above visual impediment list, the student identifies those caused by darkness and suggests compensatory measures.

Affective

Opens windows and uses defroster when driver education vehicle windows steam up.

Resource Information

5.1 *Clean Windshield and Windows*

a. A clean windshield is important any time but critical at night.

(1) Approaching lights are easier to face through a clean windshield. (Dirt and road film diffuse light.)

(2) A bug that is only a speck by day is a glaring spot at night. (p. 36; DLM)

(3) If the windshield is dirty, so are the headlights.

b. Windshield wipers and washers help to maintain good forward visibility in spite of weather conditions. (p. 34; DLM)

(1) If the windshield wipers streak the windshield, they may be covered with road film. The blades should be cleaned with water and detergent.

(2) If they continue to streak, the rubber blade has probably deteriorated and should be replaced.

(3) If new blades fail to improve the situation, the tension or pressure of the blade should be checked.

(4) Wipers should be stopped when rain or snow stops to avoid scratches that will eventually reduce the transparency of the glass. Scratches are also caused by using a dry cloth to clean a dirty windshield.

(5) The windshield washer should be kept in good repair and filled with water and windshield cleaner. (The cleaner helps to remove dirt and bugs from the glass and in winter protects the washer parts from freezing.)

c. Inside surfaces of windows may fog in winter or summer.

(1) The defroster rather than cloth or tissue should be used.

(2) Blower air needs to be heated in winter.

(3) Sudden fogging or icing may require the driver to get off the road as quickly and safely as possible.

d. Visibility on the side and rear of the vehicle enables the driver to select a safe path and speed.

(1) Failure to remove snow, ice, or frost from the windshield and all windows is negligence.

(2) Cigarette smoke and dust cling to the inside of the glass and gradually reduce vision.

5.2 *View Obstructions*

a. View obstruction caused by vehicle design, a sticker on the car window, or an item within the vehicle is much enlarged at a distance from the vehicle. (The driver should hold a hand at arm's length and notice the size of the area blocked out at 100 feet.)

b. Operators can reduce the view obstruction hazard caused by parked and moving vehicles by adjusting their spatial relationship to them.

(1) Trucks are a problem because one cannot see other traffic through them.

(2) In rain, trucks in passing throw a spray of water that interferes with vision.

c. Operators can reduce the problem of barriers to sight like buildings, blind corners, or parked cars by expecting potential hazards behind the barriers.

d. In addition to interfering with the driver's movements, a passenger sitting in the middle of the front seat may obscure the driver's vision to the rear through the rearview mirror or obstruct the driver's check of the blind spot on his right. (It is safer to seat three in back than three in front.)

e. One of the most practical and least costly measures that may be used to improve the operator's visibility is to eliminate signs, bushes, trees, poles, and parked cars near intersections.

5.3 *Climatic Conditions* (P. 35; DLM)

a. Rain, particularly at night, can distort vision because wet surfaces reflect lights.

b. Aside from helping the oncoming operator to see, switching lights on in a heavy rain also helps the driver directly ahead whose back window is rain splattered. An unlighted vehicle is difficult to detect in a mirror during heavy daytime rain.

c. Headlights on low beam are more effective in fog (rain and snow, too), because fog is made up of tiny particles of water that act like mirrors to reflect high beam lights. In light fog, lights on high beam may show more of the road in spite of the glare.

d. The face shield used by the two-wheeled vehicle operator impedes vision when wet and fogs up in cool weather when the vehicle is not moving.

e. In fog, heavy rain, snow, and at other times when visibility is extremely poor, one should drive slowly, hug the side of the road, and glance frequently at the edge of the road to maintain bearings.

f. The sun can be a particular hazard, because the eye adapts slowly to changes in light intensity.

(1) When facing the blinding effects of the sun (early morning and late afternoon) a driver can improve his vision by keeping the windshield clean, properly positioning the sun visor(s), and wearing sunglasses.

(2) When driving away from the sun, a driver should not assume oncoming operators can see his car. (Headlights should be on.)

(3) After hours of driving in the bright sunlight, visual efficiency is reduced at dusk and in darkness.

5.4 *Night Conditions*

a. The visual detail available to help the operator during the day is reduced appreciably at night.

(1) Aside from reducing detail, darkness conceals hazards (pedestrians, two-wheeled vehicles, stalled cars, curves, and other objects or conditions); hence, the operator makes decisions based on sketchy and incomplete information.

(2) Judging the speed and position of another vehicle is more difficult at night.

(3) Operators must depend on headlights that illuminate only a relatively short and narrow path ahead. (Light does not bend.)

(4) The amount of adequate highway lighting is limited.

(5) Glare from roadside lighting and from headlights of oncoming vehicles impairs visibility.

b. To compensate for the handicaps imposed by darkness, the driver should:

(1) keep panel lights dim for better vision but always have enough panel light to read the speedometer;

(2) reduce stopping distance by slowing down in order to stop within the visible distance;

(3) increase sight distance by keeping the headlights clean and properly aimed and the windshield clean;

(4) watch beyond the headlights on or near the road for slow moving or unlighted vehicles, curves, T intersections, road obstructions or defects, trains, pedestrians, and animals;

(5) avoid looking directly into headlights of oncoming vehicles;

(6) increase his following distance;

(7) allow a greater margin of safety when overtaking and passing;

(8) observe carefully and obey fully all rules of the road, traffic signs, and signals;

(9) not wear sunglasses or tinted face shields (motorcycle operators) at night; and

(10) keep face shield clean and free of scratches that increase glare at night.

c. When visibility is reduced by darkness or weather conditions, other operators are similarly hampered. (p. 35; DLM)

(1) Clear and timely signalling of intention to slow, stop, or turn is more important at night.

(2) Taillights, back-up lights, license plate lights, and turn signals must be functioning.

(3) Headlights should be on low beam at dusk and during day-time periods of low visibility. A driver can see better, and other operators can see him (particularly important for two-wheeled vehicle operators).

(4) Headlights should be on low beam when an oncoming vehicle is approaching and when following or passing another vehicle. A quick flash of high beam may be used to indicate a pass.

(5) If for some reason a driver must stop along the highway, he should pull well off the travelled portion and actuate a 4-way flasher.

Part II On-Highway Tasks
Unit C Critical Situations
Episode 1 Response Anlaysis

EPISODE PRINCIPLE Conditioning and constant vigilance help the operator prevent critical situations from going beyond the point of no escape.

EPISODE PURPOSE Occasionally, even the most competent operator is confronted with a critical situation caused by hazardous road conditions, mechanical malfunction, or an unpredictable outside force or obstacle. The operator should be prepared to cope with these situations. This episode should help the student understand how the human functions in driving are "short-circuited" in many critical situations and what implications this reality has to driver behavior.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Typical Responses	Critical situations such as skidding, brake failure, and tire blow out allow little or no time for decision-making and frequently produce the wrong response.	*Cognitive* Identify critical situations that commonly face a vehicle operator, predict how unprepared operators are likely to respond, and explain why they respond that way. Relate analysis to the basic human functions (IPDE).
1.2 Pre-Conditioning	Some experience with a critical situation either in reality or by means of mental rehearsal reduces the emotional impact and increases the probability of evoking the correct response.	Explain how a vehicle operator can increase the probability of responding correctly in a critical situation and illustrate with examples in traffic situations. *Affective* Constantly analyze possible crucial driving situations.

Learning Activities

1. Have the students identify and explain various critical driving situations they have observed. Through class discussion analyze each situation and explore the reasons the driver responded as he did. Relate the responses to the human functions (IPDE).
2. Have the students identify and discuss critical situations outside of driving (home, sports events). The discussion should reveal the nature of the response to each situation and factors leading up to each.

Evaluation

Cognitive

Given a description of a common critical situation that was not controlled, the student identifies various driving errors committed and relates them to the human functions (IPDE). Student then identifies alternative actions that could have corrected the situation.

Affective

Using commentary driving, the student's mental sets can be evaluated as he drives.

Resource Information

1.1 *Typical Responses*

a. Skilled reactions are not necessarily dependable under emotional stress or panic.

b. Most panic occurs when the operator is surprised by a hazard.

c. A strong stimulus that surprises the operator tends to produce an impulsive, or unplanned, response.

d. Correct automatic reactions must be learned in advance; otherwise, emergencies may and frequently do evoke incorrect responses.

1.2 *Pre-Conditioning*

a. Although panic tends to paralyze the reasoning center of the brain, it can be avoided by thinking; thus knowing what to think and how to perform is important.

b. The ability to cope with road and vehicular emergencies depends upon the operator's mental state.

c. Difficulty and danger preclude rehearsing many critical situations (skidding, brake failure, etc.), but knowledge of what to do and practice via the imagination can help one to respond correctly.

d. By creating a continual series of imaginary situations and hazards (hypotheses or guesses based on experiences), an operator prepares himself in advance to do the right thing in a crucial situation.

e. After much repetition, these responses become semi-automatic.

f. The operator who can control himself in an emergency can probably control his vehicle.

Part II On-Highway Tasks
Unit C Critical Situations
Episode 2 Distractions

EPISODE PRINCIPLE Inability to sustain vigilant attention over long periods of time is a human limitation which often contributes to a critical situation.

EPISODE PURPOSE Distractions appear to be common contributors to critical situations the operator must be prepared to handle. Distractions, both inside and outside the vehicle, must either be ignored or adjusted to. The purpose of this episode is to identify those distractions which often create critical situations and to help the student develop mental habits to adjust to the distractions.

Concepts	Supporting Principles	Behavioral Objectives
2.1 Environmental Distractions	Environmental and vehicular factors can encourage the operator to disassociate himself (mentally) from the driving task.	*Cognitive* Classify potentially distracting environmental factors, predict the possible consequences, and formulate compensatory measures.
2.2 Distractions Within the Vehicle	Certain physical actions by the driver, some unrelated to the actual driving task, must either be avoided or accomplished without interfering with vehicular control.	Classify potentially distracting within-vehicle (non-passenger) distractions, and suggest personal means for reducing or eliminating the hazard created by these conditions.
2.3 Passengers	Passengers can be an asset or a liability to the driver.	Describe the ways in which a passenger can be an asset or a liability to the operator.
		Affective Maintain attention to driving in spite of distractions.

Learning Activities

1. Have each student ask other drivers (parents, classmates, relatives) for their personal driving experiences involving environmental distractions. A checklist of the summary of distractions noted during the survey can then be prepared.

2. Set up the following for role playing:

(1) Record simple math problems on a tape recorder.

(2) Seat one student in a chair with two students beside him and two students behind him to simulate a driver-passenger situation. (Repeat this procedure as space dictates).

(3) Using a list of within-vehicle distractions prepared by students or teacher, the simulated passengers attempt to distract the driver enough to keep him from solving the simple math problems recorded on tape.

3. Have each student prepare a list of within-car (non-passenger) distractions. The student is to observe the actions and reactions of drivers to the distractions, make written notes, and report to the class.

4. Ask each student to make a list of possible tasks which the driver may have to perform that might distract his attention.

Evaluation

Cognitive
Divides a list of distractions into categories (within and outside of vehicle) and describes some specific means for reducing the impact of the distractions.

Affective
Does not let pedestrians along the driving route interfere with the control of the driver education vehicle.

Resource Information

2.1 *Environmental Distractions*

a. Although modern highways and vehicles have been engineered for safety and comfort, the design can also lull the driver into inattention.

(1) Highway designers are cognizant of this and are building highways with more stimuli and variations.

(2) In long-haul driving, a droning engine, humming tires, monotonous scenery, fixed eye position, and physical immobility may induce drowsiness.

b. Frequently, when the operator's attention is most necessary, the distractions are most numerous. In cities particularly, the operator must disregard a barrage of distractions, many deliberately designed to attract attention.

c. The danger of inattention in driving can be minimized by:

(1) realizing when and where inattention and distraction are most likely to occur and developing mental habits and discipline to reduce them; and

(2) developing good operational habits.

2.2 *Distractions Within the Vehicle*

a. The driver should be sure doors, seats, mirrors, windows, and seat belts are properly secured and adjusted before moving the vehicle.

b. To attend to a problem while underway (unlatched door, outside mirror adjustment, bee in the vehicle), it is safer to leave the highway.

c. The driver should avoid reaching for something that has fallen on the floor until he has stopped the car.

d. He should learn to adjust the heater, air conditioner, radio, windshield wipers, inside rearview mirror, and front window (driver's side) without taking his eyes off the road except, if absolutely necessary, for brief intervals.

e. Although the throttle, front brake, clutch, carburetor, headlight, and mirror of a two-wheeled vehicle can easily be adjusted while riding, it can be hazardous to do so.

2.3 *Passengers*

a. Passengers can serve as navigators by looking for destination or turn-off points, reading maps and giving directions, and tactfully spotting any cues to aid the driver.

b. Passengers can handle non-operational tasks such as temperature control, radio adjustment, child control, and other activities that might distract the driver.

c. Passengers should refrain from irrelevant (to the driving task) conversation when the driver needs to concentrate fully.

d. Passengers can be held liable for offenses that contribute to an accident.

e. A driver should try to talk to passengers without looking at them.

f. The passenger of a two-wheeled vehicle can affect steering and stability through his body position and movement. (p. 56; DLM)

Part II On-Highway Tasks
Unit C Critical Situations
Episode 3 Traction Loss

EPISODE PRINCIPLE When tires lose their traction, the result is partial or complete loss of car control.

EPISODE PURPOSE This episode is designed to prepare students to maintain vehicle-road stability under adverse surface conditions and during stops. Unfortunately, most driver education programs cannot include practice in skidding, but mental conditioning can take place through simulated exercises. Furthermore, students can acquire insight into the causes and prevention of skidding. The episode is closely related to Part II, Unit A, Episode 1.

Concepts	Supporting Principles	Behavioral Objectives
3.1 Over-powering	Traction is markedly reduced when wheels spin as a result of over-power usually on take off.	*Cognitive* Classify the causes, prevention, and correction for the types of traction losses mentioned in Concepts 3.1 through 3.6.
3.2 Over-braking	Traction is lost when wheels skid from over-braking, brake malfunction, or improper use of the shifting lever and the accelerator.	
3.3 Turns and Curves	Skidding or sliding on turns or curves occurs when the inertia force is greater than the side thrust frictional force of the vehicle. The cause is an improper combination of speed and directional change.	
3.4 Unequal Traction	When the wheels of a vehicle generate unequal traction due to pavement conditions, control of the vehicle may be threatened without any change in direction or speed.	
3.5 Hydroplaning	The right mix of speed, fluid on the road surface, and tire tread can result in a vehicle losing all contact with the road and, therefore, loss of traction (hydroplaning).	
3.6 Snow, Mud, or Sand	With know-how and proper equipment an operator can extricate his vehicle if it becomes mired in snow, mud, or sand.	
3.7 General Measures	A competent operator rarely allows his vehicle to lose traction, but if he does, he possesses the capability to cope effectively with the situation.	Develop a set of principles and practices for preventing and correcting any kind of traction loss. *Affective* Obey a set of preventative and corrective practices selected for any kind of traction loss.

Learning Activities

1. Demonstrate the concepts in this episode, using transparencies or a magnetic board.
2. Simulation films can provide the opportunity for exposure to traction loss but without feeling. However, the steps for correcting the loss can be learned through conditioning. This does not assume that the student will respond that way in a real situation, but it does create a positive mental set.
3. Some traction losses may be demonstrated in the driver education car. Some are actually practiced by students in protected areas (skid pans).

Evaluation

Cognitive

Using an objective test, matches types of traction losses with their causes, prevention, and correction.

Through simulation, responds to various traction losses.

Affective

In the driver education vehicle, recognizes traction loss early and corrects the loss.

Resource Information

3.1 Over-powering

a. If a skid occurs as a result of over-powering, the car will spin. Once a car spins beyond a certain angle, estimated to be about 20° to 25°, control is totally lost.

b. Over-powering on a curve allows centrifugal effect to take over.

c. The skill of starting on a slippery surface lies in applying the power to the drive wheels so they grip gently and gradually.

(1) With manual transmission, the driver should start in second or high by slipping the clutch.

(2) With automatic transmission, he should brake with the left foot, accelerate gently, then graudally release brake pedal to transmit power gradually to the drive wheels. Automatic transmissions tend to make sudden transmissions of power, because a slight windup of the engine is required to make the transmission function.

d. If tires do spin, power should be reduced and/or preventative measures applied.

3.2 *Over-braking*

a. When the front wheels lock because of improper brake adjustment, steering is ineffective and rear wheels act as a rudder to keep the car going straight ahead. (Brakes should be released and the car slowed down.)

b. When rear wheels lock because the brakes need to be adjusted, the car will spin. (The driver should remove his foot from the brake, slow down, and steer in the direction of the skid.)

c. When the grip of the brakes or tires is unequal, the car tends to swing or pivot around the wheel with the strongest grip.

d. In a panicky stop, an all-wheel braking skid occurs even with good brakes. To regain traction, the driver must release the brakes, because he cannot steer a skidding car when all four wheels are locked.

e. Changing to a lower gear ratio at too fast a speed on ice can trigger a skid as can releasing the accelerator suddenly.

f. If he must stop urgently on a slippery surface, intermittent application of the brake pedal (cadence braking) prevents wheel lock-up and enables the driver to maintain steering control. (p. 36; DLM)

3.3 *Turns and Curves*

a. Rear wheels skid from oversteering; front wheels skid from understeering.

b. A constant speed suitable for conditions (curvature and coefficient of friction) prevents sliding action on curves.

3.4 *Unequal Traction*

a. Ice is not uniform (rough, smooth, dry, wet).

b. Icy or snowy patches are sometimes found where the sun does not hit the road surface.

c. When one or two wheels drop off the edge of the pavement, unequal braking and steering result.

(1) A firm grip on the steering wheel is necessary to keep the car travelling straight ahead if it is straddling the pavement edge. (The wheel will pull right.)

(2) The driver must resist any immediate urge to whip the car back on the pavement.

(3) By easing off the accelerator the vehicle slows down gradually.

(4) If braking seems necessary, a gentle on-off technique enables the driver to maintain control.

(5) A thorough visual check ahead, to the side, and to the rear is essential before returning to the road.

(6) After speed has been reduced, the wheels can be turned sharply (depending upon the shoulder drop), permitting the vehicle to climb the pavement edge.

3.5 *Hydroplaning*

a. As speed increases on a wet road surface, a wedge of fluid builds up at the point of contact between the tires and road until the tires begin to ride (plane) on the film of water. Usually the operator has no warning until a change in speed or direction throws the car out of control. (p. 36; DLM)

(1) At 30 mph or less, tires with tread cut through the water and remain in complete contact with the road.

(2) At 30 to 55 mph, the water wedge may penetrate tire-road contact, resulting in partial hydroplaning.

(3) At 55 mph or more, the water wedge may increase, causing tires to lose contact with the road completely.

b. Hydroplaning depends on speed, on the depth of water on the road surface, on tire tread (depth and design) and pressure, on wheel alignment, and on road surface.

(1) Tires with open-treading (outlet for fluid) plus sipping (thread-like design in a tread) tend to push the water out of the way in a squeegee action.

(2) Properly inflated tires with good tread can cut better into a film of water on the road surface and prevent a "space pocket" from forming under the tires.

(3) The deeper the surface fluid the more likely the water will choke the open spaces in the tire tread.

(4) Hydroplaning can result from ordinary road film lubricated by moisture from the first five minutes of a rain storm, from fog, or from dew.

(5) Improvements in road surfaces (grooving) and tire design help to reduce the hydroplaning hazard.

c. To prevent and respond to hydroplaning the driver should:

(1) drive with well-treaded tires, properly inflated;

(2) reduce speed below hydroplaning speed particularly when approaching curves or other changes in pitch or incline in the road; and

(3) if hydroplaning should occur, decelerate and wait for tires to regain traction.

3.6 *Snow, Mud, or Sand*

a. The most effective means of moving a vehicle mired in snow or mud is to provide better friction between the drive wheel tires and the surface by spreading such things as sand, cinders, an old piece of carpeting, traction mats, or pieces of brush under the tires.

b. Sometimes the process of rocking the vehicle skillfully solves the problem (questionable practice in a vehicle with an automatic shift).

c. When a driver is stopped on two different surfaces, one rear wheel may encounter less resistance to turning than the other, resulting in one spinning and the other doing nothing.

(1) On most vehicles, if one wheel spins, the car is just as stuck as though both were spinning.

(2) Some cars now have a limited slip differential system that forces both wheels to turn, even though one has very little traction.

(3) If the vehicle has front-wheel drive, traction is required under the front wheels to move the car.

(4) Vehicles with four-wheel drive have a considerable advantage in maintaining traction.

d. To reduce the probability of becoming stuck in mud, snow, or sand, the driver should:

(1) make every effort to keep moving — shift into second or low gear before entering the section;

(2) gain speed before attempting to turn and avoid sharp turns;

(3) try to avoid driving in deep ruts — look for solid ground in the center of the road or on the shoulder or straddle the ruts.

e. If the engine stalls in a snow bank, he should open the car windows and shovel the snow away from the exhaust pipe before trying to extricate the car to prevent carbon monoxide poisoning.

3.7 *General Measures*

a. The probability of skidding can be minimized by:

(1) keeping the brakes and tires in good condition;

(2) lengthening sight distance and reacting to developing hazards well in advance;

(3) matching vehicle speed to road conditions; (p. 20; DLM)

(4) controlling speed smoothly and gradually, tracking, and braking (and by avoiding over-powering, oversteering, and over-braking);

(5) periodically checking the feel of a slippery surface by gently applying the brakes when there is no traffic nearby; and

(6) staying off the highway when road surface conditions are extremely hazardous.

b. To regain traction and return the vehicle to its normal course when the rear end of the car slides around, the driver should:

(1) steer in the direction of the skid far enough to point the front wheels in the direction he wants to go; (Over-correction can cause a violent counter-skid.)

(2) straighten the steering wheel as soon as he feels the rear end starting to return to course; and

(3) be ready for a counter-skid, upon which he should steer in the direction of the skid far enough to point the front wheels in the direction he wants to go. (p. 36; DLM)

Part II On-Highway Tasks
Unit C Critical Situations
Episode 4 Vehicle Malfunctions and Failures

EPISODE PRINCIPLE When a sudden vehicle malfunction occurs, particularly to one of the basic control devices, the operator's skills and emotions are tested.

EPISODE PURPOSE This episode stresses the procedures to be followed when critical situations triggered by vehicle malfunction and failure occur unexpectedly. A good vehicle maintenance program helps to reduce the probability of vehicle malfunction or failure but does not completely eliminate the possibility. To avoid panic, drivers should be mentally prepared for such an event.

Concepts	Supporting Principles	Behavioral Objectives
4.1 Brake Failure	Any decrease or loss in braking power compels the operator to maintain steering and positioning control and regain speed control.	*Cognitive* Describe the steps drivers should follow to handle the vehicle malfunctions and failures listed in Concepts 4.1 through 4.9.
4.2 Steering Failure	Steering failure is a somewhat uncommon critical situation but extremely dangerous when it does occur.	
4.3 Tire Failure	Steering control is threatened when a tire blows out or the air pressure in the tire diminishes.	
4.4 Stuck Accelerator	When the accelerator pedal sticks, power must be cut off the drive wheels.	
4.5 Headlight Failure	Even with careful maintenance, a critical situation involving headlight failure may arise. The driver can try to light the lights again temporarily by hitting the dimmer switch or by using other techniques.	
4.6 Hood Flies Up	When the hood flies up while the car is in motion, the driver's view is greatly limited.	
4.7 Stalled Engine	A stalled engine may be restarted by various techniques.	
4.8 Overheated Engine	Engine overheating is revealed by the temperature light or gauge.	
4.9 Emergency Stop	A vehicle can become disabled or run out of gas at any time.	
		Affective Recognize vehicle malfunctions before they are of major consequence.

Learning Activities	Evaluation
Have the students take part in a buzz session. Divide the class into nine groups, designating one person in each group as leader. Present each leader with a sheet of paper containing the following directions: Your group will have 10 minutes to discuss the following questions: What would you do if you were driving and the brakes failed? The steering failed? After 10 minutes you will be allowed 5 minutes in which to list in order, the best actions to take for the situations described in the questions. You are not to use references. After 15 minutes each group leader will read his list to the class and additions and corrections will be made as necessary.	*Cognitive* Given a list of vehicle malfunctions that can occur while driving, the student writes the procedures to be followed for each malfunction. During the laboratory period, demonstrates or sees demonstrated the proper ways to react to vehicle malfunctions.

Resource Information

4.1 *Brake Failure*

a. Brake failure or malfunction results from:

(1) a leak in the hydraulic brake system — affects all four wheels equally (sinking brake pedal);

(2) loss of friction between the drum and the lining because of overheating (fading brake pedal) or, in the case of an old car, wet brakes;

(3) air trapped in the brake lining system, or twisted or worn brake hose (spongy brake pedal); and

(4) breakdown of some mechanical linkage within the system.

b. When brakes fail, the driver should:

(1) pump the brake pedal in an attempt to build pressure and restore braking action long enough to get off the road;

(2) set the parking brake with a slow, steady pressure, if the above action does not suffice, and at the same time, hold release lever in "off" position to prevent brake lock-up that could cause the vehicle to skid out of control;

(3) downshift allowing engine braking to reduce speed;

(4) find an escape route — a safe exit from the highway; and

(5) while attempting to maintain steering and speed control, communicate his emergency situation to other highway users (sound horn, flash lights).

c. In extreme cases, the driver may slow down by:

(1) running along an embankment;

(2) scraping against a curb;

(3) driving into bushes, hedges, or snowbanks; or

(4) sideswiping a row of parked cars.

d. If loss of braking power or uneven action results from wet brakes, the driver must dry them by:

(1) staying in low gear and pumping gently; or

(2) applying slight pressure on accelerator while brakes are being applied with the left foot. (This technique can also be used after driving through water to dry brakes.) (p. 36; DLM)

4.2 *Steering Failure*

a. If power steering fails, the driver can gain control by gripping harder and steering more firmly.

b. If something goes wrong with the steering linkage, the driver must stop as quickly and safely as possible.

4.3 *Tire Failure*

a. If the front tire blows out, the front wheels tend to be pulled in the direction of the blowout.

b. If a rear wheel blows out, the rear of the car may swerve or sway violently.

c. No matter which tire blows out, the driver must:

(1) tighten his grip on the steering wheel and steer a straight course;

(2) ease up on the accelerator to allow engine braking to slow the car;

(3) brake with a firm, steady pressure to avoid wheel lock-up;

(4) look for an escape route when the vehicle is under control and drive completely off the road (even though he may ruin the tire) to a level spot where he can change the tire safely; and

(5) set the parking brake to maximum tension and move the selector lever to "Park" (manual shift car — place the gear in reverse or low).

d. A tire emergency does not end when the car stops, because the driver must call for help or change the tire. Directions for the jack are usually inside the trunk lid.

e. Captive-air tires (a tire within a tire) practically eliminate roadside tire changes.

4.4 *Stuck Accelerator*

If the accelerator sticks, the driver should:

a. Immediately place the gearshift lever in neutral, apply brakes, pull off the road, and turn off the ignition. (Try to find and remedy the trouble.)

b. Depress the clutch in a manual shift car to disengage the power from the rear wheels.

c. Turn off the ignition first if the vehicle does not have power brakes or steering.

4.5 *Headlight Failure*

If the headlights fail, the driver should:

a. Slow down quickly, keep the car in its path, and look for an escape route.

b. Watch for anything to orient himself as he slows.

c. Try the parking lights or auxiliary lights on the car (spot lights or fog lights).

d. Flash the brake lights and the right turn signal.

4.6 *Hood Flies Up*

If the hood flies up, the driver should:

a. Look under the center of the opened hood or out of the left window, steer carefully off the road, and stop.

b. Make sure the hood is properly closed after having been opened.

c. Stop immediately if hood vibrates as he drives and make sure it is closed properly.

d. Make sure the safety latch is operative before proceeding if the situation has occurred.

4.7 *Stalled Engine*

a. A stalled engine usually can be re-started by placing the selector lever in "N" (clutch down in manual transmission) and turning the starter switch while the car is moving.

b. An alternative in a manual shift car is to put the clutch down and the gear shift lever in second gear, then to let the clutch out slowly.

c. If these techniques are unsuccessful, the driver should look for the first opportunity to signal and to coast off the road.

4.8 *Overheated Engine*

If the engine overheats, the driver should:

a. Pull off the road, place shift lever in neutral, and run engine at a fast idle to circulate water and cool it.

b. Watch the temperature indicator. (If temperature reduction is not quickly apparent, he must stop the engine.)

c. Raise the hood but leave the cap on while waiting for the engine to cool. (He should examine for external leaks, broken fan belt, or anything that might slow the movement of the coolant or air.)

d. Remove cap carefully after system has cooled and check coolant level. (If the system appears normal and unrusted, apparently the trouble is mechanical.)

e. Drive slowly, after system has cooled, to a service station if one is near; otherwise, have the car towed. (The trouble may be in the water pump or the thermostat.)

f. If fire breaks out under the hood:

(1) use a dry chemical fire extinguisher;

(2) try to smother the fire with a blanket if an extinguisher is not available; and,

(3) if fire is out of control, stand at least 50 feet from the vehicle, because the gas tank can explode.

4.9 *Emergency Stop* (p. 38; DLM)

a. If the vehicle fails on the travelled part of the road, the driver should attempt to get it off the road by coasting, pushing, or using the starter in a manual transmission. If unsuccessful, he should:

(1) turn on warning flashers;

(2) tie something white to the door or radio antenna, raise hood and trunk; and

(3) seek help.

b. If successful in moving the vehicle well off the pavement, he should:

(1) get out on the right side if near the stream of traffic;

(2) at night, use "emergency" turn signal switch, turn on dome light, and set out emergency flare or lights;

(3) raise the car hood and tie a white cloth to the lefthand door handle or radio antenna;

(4) as protection from unscrupulous towing operators find the towing procedure in the car owner's manual and be certain the car must be towed; (Reputable towing operators carry spare cans of gasoline and a booster battery.) and

(5) learn from experience to keep the gasoline tank between half full and full and the car in good condition.

c. In isolated areas, women should stay in the locked car and wait for the police. (They should wave strangers by and tell them help is on the way.)

d. To stretch out a low supply of gas, the driver should use easy starts, moderate speed, coasting, and if necessary sway the car from left to right to move the fuel from the low end of the tank.

Part II On-Highway Tasks
Unit D Controlling Consequences of Highway Collisions
Episode 1 Highway Accidents

EPISODE PRINCIPLE Highway accidents and congestion reflect a breakdown or malfunction in the system providing one measurement of the system's efficiency and effectiveness.

EPISODE PURPOSE This episode deals with traffic accident data to acquaint the student with the dangers of vehicle use. In addition, the content emphasizes (1) how accident records can be used to correct deficiencies in the system, (2) that most accidents are due to inefficiencies and therefore can be controlled, and (3) that accidents are due to multiple causes and therefore require multiple solutions.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Traffic Accident Facts	Properly interpreted, highway accident facts reveal the magnitude and trends of the problem and serve as valuable indicators, or clues, to causative factors.	*Cognitive* Analyze traffic accident data, and suggest implications of this data for system improvement.
1.2 Accident Records	A good accident records system and accident prevention program go hand-in-hand. The records system identifies the critical problems to be called to the attention of the appropriate agencies.	Summarize the purposes served by a good accident reporting system.
1.3 Accident Definition	A highway accident is an unplanned event which frequently leads to personal injury or property damage and is invariably preceded by an unsafe act and/or an unsafe condition.	Define the term *accident*, emphasizing preventability rather than chance.
1.4 Multiple Cause Concept	Highway accidents, as well as other accidents, generally result from a combination of man-machine-environmental factors acting in a closely interwoven fashion (multiple cause concept).	Define the multiple cause concept, and identify the implications it has for driver behavior and highway safety management.
		Affective Accept the fact that accidents can happen to anyone, including himself.

Learning Activities

1. Present national, state, and local traffic accident data using visual aids.
2. Analyze charts and graphs of traffic accident data looking for underlying reasons that explain the surface facts. (Use facts from Massachusetts Accident Statistics.)
3. Present the characteristics and values of a good accident reporting system, using tables, charts, and spot maps.
4. Have the students test the appropriateness of the dictionary definition of the term *accident* by applying it to an accident with which they are familiar.
5. The students can ask a number of people of various ages to define the term *accident*. A committee can summarize the results, and each student can formulate a definition of the term based on ideas that evolved out of the previous activities.
6. Have a student analyze the factors involved in a traffic accident to determine *the* cause, discovering that accidents have multiple causes involving all three components of the system.

Evaluation

Cognitive

Given a chart showing the states' most recent accident records, the student develops recommendations for improvements and justifies each.

Lists accident reporting system purposes.

Writes a definition of the term *accident*.

Writes a definition of the multiple cause concept and describes how it can affect driver behavior and highway safety management.

Affective

A short questionnaire on feelings toward accidents may indicate acceptance of possible accident involvement facts.

Resource Information

1.1 *Traffic Accident Facts*

a. Highway accidents represent a major social and economic problem. A few examples follow to illustrate the loss in human resources:

(1) At the present rate of fatalities two million people will have been killed on the highways by the mid-1970s.

(2) The mileage fatality rate (per 100 million miles driven) in the United States declined quite steadily from 9.8 in 1946 to 5.16 in 1961, fluctuating only slightly since then.

(3) On the average, one person dies in a motor vehicle accident every 10 minutes, and a personal injury occurs every 17 seconds.

(4) Accidents are the leading cause of death in the United States from age 1 to 37, and motor vehicle accidents are responsible for the largest single portion of these.

(5) For youths aged 15 to 24 years, motor vehicle accidents cause more than 40 percent of the total number of deaths.

(6) Fatal accidents amount to only a small percentage of the total number of accidents and are not a reliable measure of overall highway accident trends.

b. An analysis of rural-urban traffic accident statistics reveals some widely different distributions of accident types.

(1) Approximately two-thirds of motor vehicle deaths occur in places classified as rural, and victims are mostly occupants of motor vehicles.

(2) In urban areas about two-fifths of the fatalities are pedestrian.

(3) Approximately one-third of rural fatalities result from one-car accidents.

(4) Injury and property damage accidents occur more frequently in urban places.

c. Most non-fatal highway accidents happen to average people under normal circumstances. (The ordinary accident and the fatal accident have different characteristics.)

d. The highway accident problem is affected by social, economic, political, and medical factors like depressions, riots, wars, urban planning, medical services, and alcohol and drug use.

e. If highway accidents and the consequences are to be reduced, a well planned and funded, aggressive attack is required.

1.2 *Accident Records*

a. An accurate understanding of the magnitude of the traffic accident problem has not yet become possible, because so many vehicular accidents are not reported.

(1) Accident reporting is under local or state jurisdiction and not nationally centralized.

(2) Not all persons are aware of their responsibilities.

(3) Criteria for reporting differ from area to area.

(4) Many accidents occur far from offices of reporting authorities.

(5) Drivers fear penalties such as revocation of licenses and loss of automobile insurance if they report accidents resulting from their own negligence.

b. A systems approach to accident reporting is required so man-machine-environmental interaction can be analyzed.

c. A good accident reporting system can identify both high accident locations and unsafe drivers.

d. Because of built-in limitations (total truth being difficult to obtain), a traffic accident records system cannot furnish definitive data on underlying causes, on comparisons of age and sex, and on other factors, but the system can suggest hypotheses that can be tested by research.

e. For optimum efficiency and effectiveness, accident reports should be uniform, complete, and accurate; and stored centrally in every state, rapidly retrievable, and compatible with the federal records system. (p. 46; DLM)

1.3 *Accident Definition*

a. The common connotation of the word *accident* provides an obstacle to accident prevention. To many, the word implies something unexpected and unpleasant occurred that:

(1) could not be helped;

(2) was inevitable and would have happened to anyone;

(3) was unforeseen and uncontrollable; and

(4) was not the driver's responsibility and for which he cannot be blamed.

b. A realistic appraisal of accident data clearly shows few events currently labeled as accidents are really chance events.

(1) Accidents are caused and can be controlled when their causes are identified and understood.

(2) Frequently, events labeled as accidents are unforeseen, but they were not unforeseeable.

(3) Most accidents reflect inefficiencies in the system. Accidents also happen because people make mistakes.

c. Injury and property damage are consequences of an unplanned event.

(1) The injury or property damage is merely a "last happening" in a series of events.

(2) When a driver falls asleep but wakes in time to avoid a collision, the event is not recorded as an accident. But studying these near accidents would furnish clues to accident causations.

(3) The events recorded as accidents — those involving injury or property damage — represent only a small percentage of the total number of unplanned events.

d. Most accidents can be prevented by improving the competency of both drivers and officials responsible for designing and managing the system.

1.4 *Multiple Cause Concept*

a. A circumstance is any condition or action accompanying an accident whether it contributes to the accident or not. A contributing cause is a circumstance without which the accident would not have happened. A cause is always a circumstance, but a circumstance is not always a cause. Each cause is equally important in an accident.

b. Of the three components in the system (man-machine-road), the operator, who almost always contributes one or more causes to the accident chain, is dominant because he can compensate for deficiencies in the other two.

c. Operators may "get away with" violations for years, because all other essential ingredients for the accident are not present. On the other hand, an accident could occur the first time the violation is committed.

d. The accident chain may already have some links in it before the trip begins (fatigue, emotional upset, vehicle malfunctions).

e. Highway accident investigation, research, driver education, and other efforts to improve the system should focus on the interaction of man-machine-road.

f. If the highway system can be designed so motor vehicles, environment, and driving tasks are compatible, and if man is adequately prepared to perform the tasks, the probability of successfully reducing accidents and increasing system effectiveness will be increased.

Part II On-Highway Tasks
Unit D Controlling Consequences of Highway Collisions
Episode 2 Minimizing Impact Forces

EPISODE PRINCIPLE As a vehicle goes into motion, physical laws cause both the vehicle and the occupants to undergo changes that would affect the consequences should a collision occur.

EPISODE PURPOSE Counter measures focusing on the postcrash phase contribute substantially to reducing the overall end results of human and property losses. Even if the number of collisions is not reduced, injuries and fatalities can be reduced by (1) educating drivers regarding impact forces and the use of protective devices, (2) better packaging of vehicle occupants, and (3) improving vehicle and highway design. Success in the first of these three objectives will help to achieve the other two.

Concepts	Supporting Principles	Behavioral Objectives
2.1 Impact Forces	The severity of injuries resulting from impact depends upon the peak load of the force, the distance in which the force is dissipated, and the distribution of the force.	*Cognitive* Predict the effect that different speeds and impact distances have on collision consequences. In addition, when given a series of emergency situations (via film, slides, or diagrams) where a quick response is needed to avoid or reduce the impact of a collision, select the best course of action from the alternatives given for each situation.
2.2 Packaging	Most motor vehicle crashes involve forces which would be survivable if the occupants were adequately packaged within their vehicle.	Describe the similarities between packaging a fragile object for shipping and packaging the occupants of an automobile for driving.
2.3 Restraint Systems	Restraint systems appear to offer the single best protection for the automobile occupant during an impact, because they prevent ejection — a leading cause of death.	Explain the reasons for using the restraint system belt.
2.4 Motorbike Operator Vulnerability	The operator of a motorbike has some special problems and protective measures to consider.	Identify the measures available to a motorbike operator that will reduce the personal injury consequences of a collision.
2.5 Highway Design	Well conceived highway design can markedly reduce vehicle-vehicle and vehicle-object collisions and, in addition, can minimize the severity of vehicle-object collisions.	Given a series of pictures, identify good and bad features of highway and near highway design with respect to collision avoidance and impact consequences.
2.6 Vehicle Design	Vehicle design plays an important part in the operator's efforts to avoid the first collision. The second collision involving the occupants of the car will not occur without the first collision.	Identify and appraise vehicle features closely associated with operator efforts to avoid collision.
		Affective Choose to wear restraining devices and encourage passengers to use them.

Learning Activities	Evaluation
1. Have the students write about the following: (1) How speed affects the force of impact. (2) How speed affects the occupants in the force of impact. (3) The safety equipment available to help protect the occupants in a collision. (4) How each piece of safety equipment helps. (5) New safety devices needed in today's automobile to provide for additional protection. 2. Use diagrams of situations where an accident is imminent to discuss alternate responses to the situations. Show some involving a motorbike. 3. Have the students examine brochures and charts available from car and motorbike manufacturers describing safety features. 4. Use slides of local highway designs that have both good and bad safety features to trigger discussion and to identify local highway design hazards.	*Cognitive* Given a picture and description of a highway collision, the student lists contributing factors to the severity of the accident. (A car-motorbike-culvert collision lends itself well to an analysis of impact factors.) *Affective* Uses restraining devices in the driver education car.

Resource Information

2.1 *Impact Forces*

a. Kinetic energy and angle of impact are major determinants in the force of impact in a collision.

(1) Doubling the weight of a moving body doubles the kinetic energy, but doubling the velocity increases the kinetic energy four times.

(2) In a collision, kinetic energy is dissipated by the crushing and bending of metal.

(3) Low speed collisions can generate forces powerful enough to cause fatalities.

(4) An object can be hit at an angle to reduce the kinetic energy dissipated by impact.

b. In a collision, the momentum of the car, occupants, or cargo is dissipated in two collisions.

(1) The first collision involves the car and another vehicle or some other object.

(2) As the vehicle is halted, the occupants or cargo, if unsecured, continue to move forward at the speed of the vehicle prior to impact. Cargo can become lethal in the process of dissipating its momentum.

(3) The second collision, a fraction of a second later, involves the occupants and some part of the car's interior or the environment.

(4) The first collision produces vehicle and possibly property damage; the second may result in bodily injury or death.

(5) Man and vehicle are decelerated at different rates as they contact different obstacles offering different resistances. The car may strike a dirt bank, while the occupant strikes the windshield.

(6) If the secondary impact can be prevented by a restraint system, the only force that might cause injury is the rapid deceleration of the body.

c. Other factors equal, the force of impact varies inversely with the distance required to dissipate the force.

(1) If the driver strikes a non-moving object (tree), the force is greater than if he strikes a moving object (vehicle), or one that can be moved easily.

(2) Head-on collisions are worst, followed by fixed object, rear-end, and side-swiping collisions.

(3) It is better to steer off the highway (usually to the right) and hit something capable of some energy absorption (bushes, snowbank) than to hit another vehicle or an immovable object.

(4) When a vehicle strikes an unyielding object like a bridge abutment, the car itself does some collapsing (bumpers, fenders, and hood), lessening the force on the vehicle occupants.

(5) The probable impact surfaces of the vehicle should be redesigned to increase impact distance and time (1/10 second compared to 1/50).

(6) The time required to dissipate momentum of vehicle occupants increases through the use of energy absorbing materials (collapsible steering wheels, padded instrument panels).

d. If impact force is distributed over a wider area, the chances of injury are reduced.

(1) Five pounds of force is excessive if one is using an ice pick.

(2) Some people have survived unbelievably high falls because the impact was distributed over a large area of the body.

(3) Projections and edges, both inside and outside the vehicle, should be eliminated when possible.

2.2 *Packaging*

a. Packaging vehicle occupants should follow principles similar to those used in shipping a fragile object.

(1) If a well designed container for fragile items does not open accidentally, neither should an automobile. Safety latches on doors reduce the risk of occupant ejection, and locking reduces the chance of a door opening if a car rolls over or is in a side collision.

(2) A protective container is yielding in order to cushion and distribute impact but resistant to crushing.

(3) A fragile object shipped in a container is normally protected by energy-absorbing materials. Padded sunshades and instrument panels and collapsible steering wheels illustrate this principle in automobiles.

(4) An article inside a package should be anchored to the container to keep it from moving. Seat belts must be anchored securely to the vehicle and worn snugly to resist collision forces.

b. Focal points identified by automotive crash injury research are:

(1) windshield — causes most head injuries;

(2) steering assembly — produces maximum injuries because exposure is greater but also restrains driver from moving forward on impact;

(3) instrument panel — dangerous when only a lap belt is used;

(4) side door panels — dangerous during side impact collisions;

(5) head support — reduces neck injuries sustained from rear collisions (should be adjusted low enough so the driver can glance over it during lane changes); and

(6) rearview mirrors, sunshades, knobs, handles — cause injury.

2.3 *Restraint Systems*

a. The best restraint system for American cars, at present, is the 3 point type including a lap belt and a shoulder strap.

(1) The lap belt, correctly mounted and worn, provides support to the body's sturdiest framework, the pelvic girdle.

(2) The lap belt has the disadvantage of allowing the head and thorax to jackknife during impact. This frequently results in the head striking the instrument panel.

(3) In the smaller European cars much less distance is between the occupant and any potential impact surfaces, so the lap belt is less effective than a system restraining the upper torso.

(4) The diagonal shoulder belt provides restraint to the upper torso, from the hip on one side to the shoulder on the opposite side.

(5) When the diagonal belt is used alone, there is nothing to prevent the lower torso from swinging forward and rotating out of the diagonal belt. The shoulder strap is not to be used without a lap belt.

(6) In the 3 point type, location of the upper belt anchorage can be critical. This fact presents a problem to the designer who must consider:

(1) seat positions for different physiques;

(2) limited attachment points; and

(3) storage of belts in one vehicle.

b. Usually at three or four, a child can begin using standard safety belts; before this, special arrangements and devices are required.

c. Entrapment accidents (fire, car submerged in water), given as an argument against seat belt use, constitute a small fraction of all accidents; furthermore, in this type of accident one is more likely to stay conscious with seat belts fastened and thus more likely to escape.

d. Recent court decisions have ruled the plaintiff's failure to wear the safety harness the car was equipped with at the time of the accident constituted contributory negligence.

e. New and better restraint systems need to be developed. An improvement would be a restraint system that functions independent of the passenger.

2.4 *Motorbike Operator Vulnerability*

a. Two-wheeled vehicles violate the packaging principle, since no enclosing structure cushions and distributes the force of impact or prevents the vehicle from spilling its contents.

b. When a crash is inevitable, jumping is often less dangerous than being thrown, because if the operator loses control of the motorbike, he stands the chance of being trapped between the vehicle and the road surface.

c. Motorbike operators can limit injuries by wearing:

(1) a helmet meeting federal standards (also required for passengers);

(2) approved face or eye protection;

(3) gloves; and

(4) sturdy outer garments — jacket, pants, and shoes. (p. 58; DLM)

d. In equipping a motorbike, the operator should consider that:

(1) protrusions like mirrors, extra lighting, roll bars, and luggage racks may wound the body in a collision;

(2) control levers without "ball-ends" can stab;

(3) seat back rests may be lethal if the bike spins;

(4) exhaust pipes can cause burns unless tucked away and shielded; and

(5) high handlebars not only limit control but may increase the severity of injury in a collision. (p. 58; DLM)

2.5 *Highway Design*

a. That highway conditions do lead to accidents can be easily demonstrated by a spot map of traffic accidents.

b. Through the control of vehicle paths, highway design can separate vehicles and keep them from head-on and crossing conflicts.

(1) When opposing lanes of traffic are separated sufficiently, head-on collisions are practically eliminated. (Appropriate guardrails help when the median strip is too narrow.)

(2) When intersections are eliminated, so are intersection accidents.

(3) Controlled access highways have a much lower mileage fatality rate than all the nation's rural roads.

c. Structures near the road contribute to an increase in damages, injuries, and deaths from automobile accidents.

(1) Drainage ditches, guardrails (some with spearlike ends), abutments, poles, signposts, hazard warning devices, temporary barricades, trees, shrubs, and parked vehicles are commonly hit by vehicles in run-off-road accidents.

(2) Many of the structures near the road should and could be removed through the efforts of public officials supported by the public.

(3) Highway engineers are now excluding many roadside features in new highways.

(4) Necessary roadside hardware like sign supports, lighting standards, and guardrails is being designed to minimize the consequences of impact.

d. Highway design features that protect "passively," without "active" participation from the driver or pedestrian (breakaway signs, lights, etc.), are usually preferable.

2.6 *Vehicle Design*

a. A vehicle must have handling qualities so it can be maneuvered quickly and accurately and a high degree of stability so it will hold the road on unfavorable surfaces. Operators need a predictable steering system to give them a feel of the road.

b. Collision avoidance largely depends on driver visibility which is influenced by body design (windshield and windows, corner pillars, hood and fenders, headlights, turn signals, taillights and stoplights, windshield wipers, and rearview mirrors.)

c. Accident avoidance also depends upon the mechanical durability and reliability of the vehicle, particularly with respect to power steering and braking.

(1) Improvements are being made in brakes and tires to aid braking performance, particularly in emergency stops (anti-skid device).

(2) Power steering helps to retain effective control when certain forces on the front wheels are increased (blow-out, wheels drop off the pavement edge, etc.).

d. Even when a collision appears inevitable, the driver should use the maneuvering and other capabilities of his vehicle to maintain control and try to avoid a crash up to the last second.

Part II On-Highway Tasks
Unit D Controlling Consequences of Highway Collisions
Episode 3 At the Collision Scene

EPISODE PRINCIPLE Highway users can benefit from being prepared to cope with post-crash situations when directly involved or when one of the first to arrive at the scene.

EPISODE PURPOSE Very few people experience a lifetime of driving without being involved in a highway collision, either as a witness or a principal. The material in this episode prepares the student to cope with this eventuality so that human suffering, financial loss, legal complications, and other undesirable consequences can be prevented.

Concepts	Supporting Principles	Behavioral Objectives
3.1 Stopping	When a highway user has knowledge of when, where, and how to stop following an accident, there is less chance of negative legal and safety consequences.	*Cognitive* Given a description of an accident scene, describe: (1) When, where, and how to stop. (2) What action to take regarding the injured and summoning assistance. (3) How to mark and control the scene. (4) What to do about exchanging information, witnesses, and recording pertinent information.
3.2 Assisting the Injured	A driver's duty after stopping his car is to check for injured persons and summon assistance if necessary. Whatever appears necessary under the circumstances should be done to relieve suffering.	
3.3 Marking and Controlling the Scene	Marking and controlling an accident scene helps to prevent a single accident from turning into a multiple one.	
3.4 Words and Deeds	What the driver involved in an accident says and does at the scene may be very important in the follow-up to the accident.	
3.5 Accident Reporting	The proper method and timely filing of a formal accident report tends to reduce the possibility of legal and financial entanglements following an accident.	Given the details of an accident and pretending he was one of the drivers involved, fill out an accident report form and indicate where the form should be sent.
3.6 Emergency Medical Services	Advance planning of emergency communications, transportation, and medical services reduces the number of deaths and severity of injuries from motor vehicle accidents (loss limiting factor).	Identify the characteristics of emergency medical services that determine their efficiency and effectiveness in dealing with motor vehicle accidents.
		Affective Accept responsibility at the collision scene and seek additional first-aid information.

Learning Activities

1. Describe an accident scene: time of day, place, drivers' condition, weather conditions, and road conditions. Explain the events leading up to the accident so that the factors are fully understood by the students. Then draw the situation on the chalkboard or use the magnetic or felt board to get the students visually familiar with the situation. Ask students where they should stop after the accident and how.
2. Bring in flares and flashing spot lamps for the class to see.
3. Go over pages 19-20 in the "Drivers' License Manual" with the students. Have them pretend an accident has taken place. Then have a student act out Concept 3.4.
4. Give each student a state accident report form to fill out using the details of the accident described above.
5. List on the chalkboard the various emergency medical services available in the immediate area.

Evaluation

Cognitive
Given the description of a single vehicle accident involving property damage and injury, the student indicates the procedures the driver should use at the scene of and after the accident. He also completes a Massachusetts accident report form on the described accident.

Lists standard elements of emergency medical services identified by the National Highway Safety Bureau.

Affective
At a simulated accident scene, the student plays the role of a witness.

Enrolls in a first-aid course or is observed reading a first-aid book.

Resource Information

3.1 *Stopping*

a. State laws require the operator of a vehicle involved in an accident to:

(1) immediately stop his vehicle at or near the scene;

(2) make the stop without obstructing traffic more than is necessary; and

(3) immediately return to the scene of the accident. (p. 46; DLM)

b. In a traffic collision the ultimate punishment is much less for the operator who stops, assists at the scene, and reports the accident to proper authorities, than it is for the person who leaves the scene. Panic, following a traumatic experience and tending to paralyze the reasoning center of the brain, sometimes causes people to hit and run.

c. A highway user has a moral, if not legal, responsibility to stop when he comes upon an accident where his assistance is needed.

(1) The stop should be made well off the travelled portion of the highway, so his vehicle does not interfere with traffic or constitute a hazard. (Precise distance varies with conditions and the state law.)

(2) At night, conditions may warrant stopping behind the wreckage to illuminate the scene with headlights.

d. Whether his vehicle is involved in the accident or not, a driver should avoid parking on the left side of the highway, because it may confuse oncoming traffic.

e. To help prevent fire, the ignition of any vehicle involved in a collision should be turned off.

f. Stopping at the scene of an accident where assistance is adequate may create an additional hazard.

3.2 *Assisting the Injured*

a. An injured person should be made comfortable, but he should not be moved without knowledge of correct first-aid procedures.

(1) Good intentions may result in further injury to the person.

(2) Moving the victim may be the better alternative.

(3) A person trapped by the steering wheel or some other part of the vehicle should not be moved. The pressure can be somewhat relieved by adjusting the seat to the extreme rear position.

b. In assisting the injured, one must not step over the boundary of first aid and into the area of treatment.

(1) First aid is the immediate and temporary care given to a victim until the services of a physician can be obtained.

(2) Treatment may be administered only by a licensed physician. (Applying medication, administering alcoholic beverage, using pain pills, and setting a broken bone are treatments.)

c. Proper application of pressure directly to the wound and at pressure points is almost always effective in controlling bleeding.

d. If sterile compresses are not available, the inside folds of a handerchief, towel, or item of clothing may have to be applied to the wound.

e. Shock can be alleviated by:

(1) placing the victim in a prone position with feet slightly elevated, except in the case of internal or severe head injury;

(2) restoring or maintaining body temperature by placing material under as well as over the victim; and

(3) attempting to comfort and reassure the person that help is on the way and that everything will be taken care of (family, luggage, etc.).

f. First-aid treatment for fracture should be limited to immobilizing the broken limb and treating for shock.

g. A dry pack or wrap of four or five layers of clean muslin or cloth will reduce pain in the case of severe burns by preventing air from striking the burned area.

h. Doctors prefer no liquids be given to injured accident victims.

i. A person may refuse aid for himself or his family because of religious beliefs. His wishes should be respected.

j. If a number of people are available, a call for assistance can be made as the injured are aided.

(1) The call should be made directly to the law enforcement agency with jurisdiction in the area. That agency will see to other needed services.

(2) The message should include the nature and location of the accident.

3.3 *Marking and Controlling the Scene*

a. Smoking should be prohibited at the scene of an accident because of the danger of fire or explosion. (p. 46; DLM)

b. At night flares, reflectors, flashlights, or other warning devices should be used to warn traffic from both directions. (They should be positioned at least 400 feet from the scene.)

c. In the daytime, warning devices are also necessary, particularly if the accident occurs near a hill crest, sharp corner, or bridge.

d. Deciding whether first to set out signal devices or to assist the injured depends on the location and nature of the accident, the severity of injury, and the availability of assistance.

e. Bystanders should be kept well away from the road, unless they can perform some service.

3.4 *Words and Deeds*

a. Arguing, accusing others, signing papers, or admitting to guilt should be avoided. (Hasty emotional admissions can be costly.)

b. The driver should cooperate with the police officer by informing him briefly.

c. He should exchange information with the other operators (name, address, vehicle registration, and driver's license).

d. If a driver strikes an unattended vehicle, he should leave identification (name, address, and telephone number) and copy the license number of the vehicle so the owner may be traced if necessary. The accident should be reported to appropriate law enforcement authorities to prevent a charge of "leaving the accident scene without properly identifying yourself." (p. 46, DLM)

e. Names and addresses of witnesses and, if possible, a signed statement of their observations should be obtained. A person who witnesses an accident or is first on the scene should leave his name and address with the driver.

f. Notes should be written at the scene so a complete report can be made and the information verified by the police. Information should include:

(1) time, date, and exact location; direction of vehicles prior to impact, location of vehicles afterward; length of skid marks; and other relevant information;

(2) condition of road surface and weather;

(3) names and addresses of all those in the other car, noting any who may be injured, sick, intoxicated, or physically impaired; and

(4) any attempts by the other driver to hide deficiencies in himself or his vehicle.

3.5 *Accident Reporting*

a. State laws and municipal ordinances vary on which traffic accidents should be reported and to whom, but one safe rule is when in doubt, report the accident. (p. 46; DLM)

b. After being involved in an automobile collision, the driver must promptly notify the nearest available insurance representative for instructions. Failure to file a prompt report with his insurance company may nullify his insurance.

c. State law requires that a written report of all personal injury accidents and all property damage accidents above a certain amount be sent to the motor vehicle department within a certain time. Some counties and municipalities also require a report. (p. 46; DLM)

d. Accident report forms can be obtained from the registry of motor vehicles, police department, insurance company, or the investigating officer.

e. Accident reports must be made regardless of whether the accident was investigated.

f. The accident report form should be filled out completely and accurately.

g. A list of the information needed to fill out an accident report form (or copy of the form itself) carried in the glove compartment will be valuable.

h. A photostatic copy of the accident report prepared by the policeman who investigated the accident should be requested.

3.6 *Emergency Medical Services*

a. When accidents occur, every available resource must be mobilized to save lives, to lessen severity of injuries, to protect property, and to restore movement of traffic.

b. The Highway Safety Act reflects the importance of emergency medical services by requiring each state in cooperation with its local subdivision to establish a program that meets standards related to:

(1) training, licensing, and related requirements for ambulance drivers and attendants;

(2) type and number of emergency vehicles, including supplies and equipment;

(3) coordination of ambulance and other emergency systems; and

(4) evaluation.

c. Plans are underway to study and use helicopter ambulances (demonstrated by the military) for highway injured.

Part II On-Highway Tasks
Unit D Controlling Consequences of Highway Collisions
Episode 4 Financial Responsibility

EPISODE PRINCIPLE Insurance provides the motor vehicle owner and others with protection against financial losses due to negligence or other action having to do with motor vehicles.

EPISODE PURPOSE Insurance is a vital factor in safeguarding the future of highway users, their families, and property. Regardless of an operator's own skill and ability, there is no guarantee that he will avoid all collisions. Every operator must be prepared to face the consequences of collision involvement. In this episode emphasis is placed on the information the student needs to make intelligent decisions regarding the reduction of highway collision consequences through insurance.

Concepts	Supporting Principles	Behavioral Objectives
4.1 Nature of Insurance	The basic principle of insurance is the spreading of risk.	*Cognitive* Relate the basic principle of insurance to that of reducing the consequences of traffic collisions.
4.2 Liability	A driver causing bodily injury or damaging property is liable for his actions (a legal obligation).	Define the terms *liability*, *negligence*, and *judgment*. In addition, construct a situation which points out the values of motor vehicle insurance with respect to liability.
4.3 Liability Insurance	Liability insurance furnishes protection if a person is proved liable for accident damages or sued.	Determine if the amount of liability insurance is adequate when given the amount awarded to a plaintiff from civil action growing out of an automobile accident and the amount of insurance carried by the defendant.
4.4 Physical Damage Insurance	Physical damage insurance is designed to compensate the driver for certain losses caused to his vehicle and/or property.	Identify and distinguish between damages claimable under collision insurance coverage and comprehensive auto insurance coverage.
4.5 Special Insurance Coverage	Many additional types of insurance fall into the special coverage category, having special value in certain situations.	Summarize the benefits of medical payment insurance, road service insurance, and uninsured motorist protection. Identify the value of a financial responsibility law and explain how to satisfy the requirements of such a law when unable to obtain insurance through routine procedures.
4.6 Factors Influencing Insurance Premiums	Many factors influence premiums for vehicle insurance.	Identify the factors which influence premium rates.
4.7 Young Driver Rates	Young drivers, as a group, are involved in more than their share of accidents. This is reflected in the insurance premiums for them.	Identify reasons for higher insurance rates among young drivers and means for keeping those rates to a minimum.
		Affective Find out if the family car is adequately insured.

Learning Activities

1. Discuss various types of insurance (life, medical, homeowner) to draw out the basic principle of insurance (spreading of risk). This can then be related to motor vehicle insurance.
2. Describe a simple one-car accident, illustrating total negligence. From this illustration other factors (another car, yield sign, chuck holes) can be presented which complicate total negligence. Students then state why liability insurance is or is not beneficial in each case.
3. The teacher gives each student a brief description of each type of insurance with spaces to be filled in by the student as the discussion progresses.
4. After all types of insurance are discussed, an earlier collision situation can be recalled and negligence established. The amount and type of insurance of each owner involved can be stated, and each student can analyze the facts to determine the costs to be paid by each person involved.
5. Select two students to visit a local insurance agent to discuss the cost of a typical motor vehicle insurance policy. They can report their findings to the class.
6. Discuss how the young driver can help to lower premiums.

Evaluation

Cognitive

Give an objective test to determine if the students have understood the principle of insurance and if they can identify the purposes of all types of insurance.

Describe a newly purchased vehicle. The student then selects the types and amount of insurance coverage the owner should seek and gives reasons for his selections.

Given a description of accident damage, the student evaluates who would be responsible for various damages.

Given a list of factors influencing insurance premiums, the student suggests ways young people can reduce premiums.

Affective

Appears aware of family's insurance coverage during discussions or indicates awareness on a checklist.

Resource Information

4.1 *Nature of Insurance*

a. All insured people help to pay for each other's losses.

b. Insurance, an old institution with an adventurous history, started when owners of sea-going vessels pooled resources to protect the individual who lost a ship.

c. An insurance policy is really a set of policies covering liability, physical damage, and special types of insurance.

4.2 *Liability*

a. An operator can be held responsible in both criminal and civil actions.

(1) If convicted of a traffic violation, the driver is punished by the state with a fine or a jail sentence (criminal responsibility).

(2) Even if a criminal law has not been violated, the person who has been injured or whose property has been damaged can sue for damages (civil responsibility).

b. A person is declared liable for damages to another individual's person or property because of negligence.

(1) A person is negligent when he has failed to act reasonably and prudently under the circumstances. (It can be either an error of commission or omission.)

(2) In other words, negligence is any conduct below the standard established by law for protecting others against reasonable risk of harm.

(3) Right-of-way and negligence should not be confused. One can be guilty of contributory negligence by striking a vehicle that went through a red light. Operators have a legal and moral responsibility to avoid conflict with other highway users, despite wrong actions of others.

c. If a court finds one driver entirely to blame for an accident, it orders him to pay the victim for his losses (judgment).

d. Liability insurance pays for judgments against the driver, within the limits of his policy. If the judgment is more than the policy limit, he must pay the excess.

e. In most states, if the court finds both operators contributed to the accident, no matter what the ratio of fault might be, no one collects under liability insurance coverage. (Some states have comparative negligence.)

4.3 *Liability Insurance*

a. Bodily injury liability insurance protects the driver against the injuries his actions cause another highway user.

(1) A judgment for bodily injury damages could include hospital and doctor bills, loss of wages, and pain and suffering. (The last item could be the largest.)

(2) Bodily injury insurance has two limits — a limit for each person and a limit for each accident (usually sold in blocks of thousands, like 10/20, 20/40, 50/100).

(3) In addition to paying judgments, bodily injury liability pays for lawyers and court costs if the accident was not the policyholder's fault.

b. Property damage liability insurance (P.D.L.) protects against damage to other people's property.

(1) The property can be another car, a house, a telephone pole, a tree, a fire hydrant.

(2) P.D.L. works like bodily injury insurance; the holder must be entirely to blame, or the company does not pay.

(3) This insurance is usually sold in blocks of $1,000, with $5,000 being the lowest sold in most states.

c. Liability insurance is the most important motor vehicle insurance coverage.

(1) A person who has been injured or whose property has been damaged could be awarded an enormous sum by the court.

(2) The court could then use the wages (garnishment) or proceeds on the property of the responsible driver to satisfy the judgment.

(3) The driver's license is suspended until the judgment is satisfied unless he is released by the other party.

(4) Insurance protects both parties.

d. Liability insurance protects the owner or "named insured," of the vehicle plus all members of his household and anyone else who has permission to drive the car.

(1) The named insured and his family are protected while driving a car belonging to someone else.

(2) The named insured is also protected if someone outside the family drives his car with permission.

(3) A son or daughter with permission to drive the family car does not have authority to give others permission to drive. (Only the named insured can grant permission.)

(4) Permission must be obtained before driving another's vehicle; the driver's license must be kept in order; and the car should never be used for illegal purposes.

4.4 *Physical Damage Insurance*

a. Collision insurance pays for damages to the policyholder's vehicle caused by collision or upset.

(1) It protects the vehicle against damage while being operated.

(2) In an accident where the other operator was not completely to blame, the driver is protected.

(3) A standing vehicle that is damaged is protected.

(4) Collision insurance, usually sold on a deductible plan, can be purchased in varying amounts, but the lower the deductible amount, the higher the premium. The insurance company pays for repairs over the deductible amount.

(5) Collision protection insures the vehicle for actual cash value at the time of the loss. Actual cash value is the replacement cost new less the depreciation. (Depreciation applies to partial losses as well as total losses.)

(6) The insurance agent may advise dropping collision insurance when the vehicle reaches a certain age and has a low cash value.

(7) Following an accident, the owner should discuss his rights and privileges under the terms of collision insurance before having the car repaired.

b. Comprehensive auto insurance pays for damage to the policyholder's vehicle caused by something other than collision or upset.

(1) Comprehensive protection covers the vehicle against direct accidental loss or damage, regardless of what caused the damage (except for collision or upset).

(2) Hazards covered include fire, missiles, falling objects, larceny, explosion, earthquake, windstorm, hail, water, flood, malicious mischief, vandalism, riot, civil commotion, and actual contact with an animal.

(3) The vehicle owner can choose to purchase only certain kinds of physical damage protection, but most people prefer the total comprehensive package.

4.5 *Special Insurance Coverage*

a. Medical payments insurance covers medical and funeral expenses up to policy limits for the policyholder and others injured or killed while riding in his car.

(1) This insurance pays regardless of who caused the accident but does not pay if the other driver is totally liable.

(2) The driver is protected from the time he gets into the car until he gets out.

(3) Extended medical payments insurance, available from most companies, covers the policyholder and his family if they are not in their own car and are hurt in or by other vehicles (includes pedestrians and bicycles).

(4) The smallest amount of medical payments protection is usually $500 and the largest $5,000. The cost of $2,000 protection is very little more than that of $500 protection.

(5) Medical payments insurance is really accident insurance.

b. Road service insurance pays towing charges if the policyholder's vehicle breaks down on the road.

(1) This protection pays the cost, but usually will not exceed $10 or $25.

(2) Repairs to the vehicle are not covered unless performed on the spot.

c. Uninsured motorist protection protects the policyholder, his family, and other passengers in his car from bodily injury losses caused by an uninsured or hit-and-run driver legally liable for the damages.

(1) In an accident caused by a person without liability insurance, the other driver may have to assume his own costs.

(2) Uninsured motorist protection pays for bodily injuries caused by a driver without bodily injury liability coverage ($10,000-$20,000 limit).

(3) Uninsured motorist insurance pays only what the driver is legally entitled to get but cannot, because the driver to blame was not insured.

(4) A number of states have a financial responsibility law to protect the public from the uninsured

motorist. If a driver is involved in an accident and does not have insurance, he is required to put up a cash bond with the state treasurer to show financial responsibility. If he does not have insurance and does not put up the cash bond, his operator's license and plates are automatically revoked, regardless of fault. The law also sets minimum liability coverages that may be sold in the state.

(5) A few states have a compulsory insurance law protecting the public rather than the individual.

d. Automobile insurance plans (formerly known as assigned risk plans) are placement services developed by the insurance industry to help people who have difficulty finding an auto liability insurer.

(1) All the auto insurers in a state agree to accept a share of referrals made by these service facilities.

(2) Under improved plans, when a company insures male drivers under age 25 through its regular underwriting procedures, its quota of referrals from this plan is reduced.

4.6 *Factors Influencing Insurance Premiums*

a. The way people in a city, county, and state drive depends considerably on how much they pay for insurance.

(1) Accident experience in a region is a major factor in determining rates.

(2) Based on the accident experience of various groups or classes of drivers, insurance companies have devised rating scales for setting premium rates (age, sex, type of car, occupation, type of driving, where the car is garaged, and the previous driving records of the vehicle's principal drivers).

(3) Some companies use merit rating, reducing the cost of insurance in the absence of accidents but increasing the cost for each accident.

(4) One accident, regardless of legal fault, can increase a $150 insurance premium by 100% or more.

(5) It is impractical for an insurance company to devise an individual rate for each motorist.

b. The cost of repairs, a determinant of automobile insurance premiums, is influenced by:

(1) rising costs of labor and replacement parts for vehicles;

(2) the integrity of vehicle owners involved in accidents and the garage mechanics who repair the vehicle; (Those who pad repair bills are cheating honest policyholders.) and

(3) fake claims.

c. The number of court judgments also influences vehicle insurance premiums.

(1) Many cases are settled out of court, but of those that are tried, judgments have cost hundreds of thousands of dollars. (All policyholders help to pay this.)

(2) To get more accident victims paid quickly and equitably, and to eliminate many of the irritations and controversies associated with the present system, various experimental plans are being tried.

d. Insurance companies and their rates are closely regulated by state insurance departments.

4.7 *Young Driver Rates*

a. When parents let their children drive the family car, they can insure them as occasional drivers under their own policy.

b. After a few years of good driving experience in the family car, a young driver usually can obtain coverage on a vehicle of his own without difficulty.

c. If the young person is given or allowed to purchase a vehicle of his own at age 16 or 17, he may experience some difficulty obtaining insurance.

d. Many insurance companies have refined their rate classifications for male drivers under 25 and female drivers under 21 to provide a better matching of premiums and loss expense, making young drivers more insurable. (Some companies are using psychological tests in an effort to make insurance more readily available to young operators who are mature in their driving attitudes.)

e. Some insurance companies provide a reduction in auto insurance premiums for students with an A and B grade average or the equivalent. This plan is based on the assumptions that:

(1) high achievers in school display a degree of maturity and conscientiousness bound to affect their driving habits favorably; and

(2) the successful student must spend considerable time studying and, consequently, less time on the highway.

f. Many insurance companies offer lower premiums to drivers under 25 who have successfully completed an approved driver education course.

Part III Readiness Tasks
Unit A Operator Fitness
Episode 1 Alcohol

EPISODE PRINCIPLE Ethyl alcohol, found in several commonly consumed alcoholic beverages, impairs the human functions involved in operating a motor vehicle.

EPISODE PURPOSE Much is yet to be learned about the underlying causes of traffic accidents, but the evidence is clear that alcohol is a frequent contributing factor, particularly in severe crashes. This episode is designed to help the student to (1) acquire accurate information about the problem, (2) examine and clarify his feelings and attitudes toward drinking and driving, (3) develop a realistic plan for handling social situations involving alcohol and driving, and (4) recognize the need for effective legislation and enforcement.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Absorption, Distribution, and Oxidation	When ingested, alcohol is directly and quickly absorbed into the bloodstream through the lining of the body (including the brain) and finally oxidized or eliminated.	*Cognitive* Describe what happens to alcohol in the body from the time it is first ingested until it is eliminated.
1.2 Affect on Body Functions	As the alcohol concentration in the bloodstream builds up, body functions are affected.	Given a list of body functions (speech, vision, judgment, coordination) in random order, arrange them in the sequence they would be impaired by increasing amounts of blood alcohol concentration.
1.3 Variables	Individual differences determine how and to what degree a person is affected by alcohol.	Identify (1) individual differences which determine how and to what degree a person is influenced by alcohol and (2) conditions which cause the same individual to be affected more at one time than another.
1.4 Influence on Driving Performance	All the capabilities required to operate a motor vehicle (IPDE) are particularly susceptible to the effects of alcohol.	Describe the effects of alcohol on the human functions involved in driving (IPDE) in the order that these effects are likely to occur as the concentration level of alcohol increases. Explain why these effects are likely to be more pronounced in young people than in adults.
1.5 Motivations and Decisions	Most young people drive, some drink, and some drink and drive.	Identify and appraise motivations that prompt young people to drink and develop personal guidelines for behavior that will minimize the risks associated with drinking and driving.
1.6 Accident Data	The immoderate use of alcohol is a major source of highway crashes, especially the most violent ones.	Compare the probability of problem drinkers and social drinkers being involved in highway collisions.
1.7 Legislation and Enforcement	Evidence supports the need for effective legislation and enforcement action to reduce the probability of alcohol-induced highway accidents.	Assess the potential of legislation and enforcement measures for reducing alcohol-induced highway accidents.
		Affective Choose not to consume alcohol before driving or not drive after consuming alcohol.

Learning Activities	Evaluation
1. Ask a student who has studied physiology to explain how alcohol travels through the body. 2. Using the inquiry technique, draw from the students how alcohol affects various body functions of different individuals. 3. List the reasons for drinking. 4. Discuss the latest Massachusetts accident statistics relating to alcohol. 5. Review with the class recent laws that have been passed relating to alcohol and driving. 6. Review developments for improving the alcohol and driving situation. 7. Ask a local policeman to demonstrate the "breathalyzer."	*Cognitive* Give an objective test to determine the students' knowledge of basic information. Given the number of car accidents and the number involving alcohol by age group in the state, the student predicts his age group's involvement in accidents and his own probability of having an accident. (He should be able to defend his prediction.) Writes a paper on the state's alcohol-driving related legislation. *Affective* It is very difficult for a teacher to observe outcomes. A checklist or rating scale may provide indications.

Resource Information

1.1 *Absorption, Distribution, and Oxidation*

a. Alcohol is digested and reaches the blood stream quickly.

b. The rate alcohol enters the blood stream through the walls of the stomach and small intestine depends on the:

(1) rate it is ingested;

(2) total amount involved;

(3) other components of the drink — straight liquor is absorbed fastest, and liquor diluted with water is absorbed most slowly; and

(4) characteristics and amounts of other foods and beverages also present in the stomach.

c. Alcohol is carried by the blood to all body tissues and distributed in proportion to the water content of the body.

d. Alcohol cannot be stored in the body like some foods but is circulated until it is oxidized or eliminated.

(1) Oxidation involves a series of chemical changes enabling food to release energy.

(2) Most oxidation takes place in the liver. (It takes about 1 hour to burn up 1/2 ounce of pure alcohol.)

(3) A small percentage (5 to 10 percent) of the alcohol is eliminated by the kidneys, breath, and sweat glands.

e. The amount of alcohol reaching the brain at one time is determined by how much the person drinks and how closely spaced those drinks are.

f. When alcohol is consumed faster than it can be oxidized, alcohol and its effects pile up.

g. The concentration of alcohol in the blood at any given time can be measured accurately by blood, breath, or urine analysis, but a rough guide for a 150-pound person is that each drink increases the concentration of alcohol in the blood by 0.02 percent.

(1) The average drink (whiskey — 1 ounce, wine — 3 1/2 ounces, and beer — 12 ounces) contains about one ounce of alcohol.

(2) Liquors (rum, gin, vodka, brandy, and whiskey) contain 40 to 50 percent alcohol; dessert or cocktail wines (ports and sherries) 18 to 21 percent, ordinary table wines up to 14 percent; and beer 4 percent.

1.2 *Effect on Body Functions*

a. In spite of deceptive outward signs (flushed face, animated behavior, etc.), alcohol operates as an anesthetic by deadening the nerve centers and is identified as a physiological depressant.

b. Alcohol's paralyzing, numbing effect on the brain begins at the higher center (cerebrum) and moves toward the lower center (medulla) of activity, as the concentration of alcohol in the blood stream increases. (The parts of the brain are affected in reverse order of their development.)

(1) First, the forelobes (cerebrum) of the brain are affected, resulting in decreased ability to reason and make judgments, weakened social inhibitions, and changed attitudes toward others.

(2) As the concentration increases, more of the forebrain is affected and, in addition, alcohol reaches the cerebellum which controls sensory-motor functions. The result is emotional instability, retarded responses, and impaired vision and coordination.

(3) At higher levels of concentration, the person is unable to stand or walk and then loses consciousness. Death results when the brain, the upper spinal column, and the respiratory and heart control centers are anesthetized.

c. The effects of alcohol increase approximately as the square of the blood alcohol concentration. (A concentration of 0.08 percent is not twice as bad as 0.04 percent, but four times as bad.)

1.3 *Variables*

a. Body weight and chemistry and attitude toward and experience with drinking cause individual differences.

b. Fatigue, emotional state, food intake, and drugs cause the same individual to be affected by alcohol more at one time than another. Some drugs when combined with alcohol produce effects exceeding the sums of the separate effects of each.

c. Aspirin, black coffee, cold showers, and exercise have little influence in reversing the principal effects of alcohol.

1.4 *Influence on Driving Performance*

a. The driving ability of most people is impaired before they display outward signs of motor impairment and other effects.

b. The insidious effect of alcohol on judgment and self-control, even in the early stages, is particularly serious.

(1) Since self-criticism is affected early, the drinker often does not recognize any change in his behavior.

(2) Even more serious is the likelihood that he feels more perceptive and skillful and, therefore, is likely to take more chances in passing, speeding, or negotiating curves. (Self-confidence increases as skill decreases — the worst possible combination.)

c. Reduced input of sensory data (effect on vision) plus diminished ability to identify and analyze absorbed data (effect on reasoning center) combine to imapir the driver's decision-making ability.

d. Responses are slowed and muscular coordination impaired due to the effect of alcohol on nerves controlling the muscles. This could make a critical difference in stopping distance and the ability to manuever the vehicle.

e. Those who have been drinking are probably far less likely to follow sensible safety practices such as signalling intentions, fastening seat belts, and other normal precautions.

f. Some individuals drive time and again after drinking and do not have an accident, reinforcing the misconception that alcohol does not lead to greater danger on the highway.

g. Even though some individuals, after a few drinks, remain better drivers than people who have not consumed any alcohol, everyone should be at his optimum performance level when driving.

h. Alcohol is likely to affect driving performance of young drivers more than that of adults.

(1) The young person who drinks lacks experience in compensating for the effects of alcohol.

(2) The young driver is an inexperienced driver; hence his skills are less automatic and more inclined to deteriorate from the effect of alcohol.

(3) Risk taking, especially strong in young people, may be accentuated by alcohol.

(4) On the average, the body weight of young people is less than that of adults.

1.5 *Motivations and Decisions*

a. Problems occur when people who have been drinking leave one social setting for another or for home. (To be free of parents and the law, young people sometimes drink in (p. 44; DLM)

b. Various motivations prompt adults and young people to drink:

(1) social pressures — to be a good social citizen and drink, or to be a good traffic citizen and not drink;

(2) self-enhancement — to demonstrate maturity, adulthood;

(3) curiosity and experimentation;

(4) desire to relax and relieve anxieties or to celebrate a special occasion; and

(5) family custom.

c. The responsible course of action in regard to drinking and driving is to:

(1) acquire accurate information about the effects of alcohol;

(2) analyze one's attitudes and feelings concerning the matter;

(3) develop strategies (mental sets) for handling social situations where drinking and driving could be involved.

d. The most intelligent alternative is to avoid the combination of drinking and driving, because the gain is not commensurate with the risk involved.

1.6 *Accident Data*

a. Alcohol contributes to about half of all highway deaths (higher in single-car fatalities) and to an appreciable percentage of the far more numerous non-fatal crashes.

(1) As the severity of the accident increases, the probability of alcohol being a contributing factor also increases.

(2) Fatal and other crashes of teen-agers and young adults frequently involve hazardous amounts of alcohol.

b. Alcoholics and other problem drinkers, who constitute a small minority of the general population, account for a very large part of the overall problem.

c. Social drinkers who drive are dangerous because:

(1) there are so many of them;

(2) they are not easy to spot and defend against;

(3) they fail to recognize their limitations.

d. The probability of being in a crash increases sharply as the amount of alcohol in the blood increases.

(1) Experts differ about how likely a crash would be with blood alcohol content below 0.05 percent.

(2) Evidence is clear that the likelihood of crash involvement increases at about the 0.05 percent level and becomes progressively and disproportionately higher at higher concentrations.

(3) The higher a driver's blood alcohol concentration: the disproportionately greater the likelihood he will crash; the greater the likelihood he will have initiated the crash; and the greater the likelihood the crash will have been severe.

e. The association between blood alcohol levels and pedestrian accidents very closely parallels the findings in studies of drivers (limited evidence).

1.7 *Legislation and Enforcement*

a. A vehicle on the highway is not only the individual's responsibility but also the community's. The impaired driver is a threat, not only to himself, but also to those on the highway.

b. All states have adopted legislation designed to control the drinking and driving problem. (pp. 42, 44; DLM)

c. The most effective combination of enforcement and education is one that preconditions the individual to set limits on his drinking and driving behavior before he takes his first drink.

Part III Readiness Tasks
Unit A Operator Fitness
Episode 2 Drugs

EPISODE PRINCIPLE Drugs and driving do *not* mix.

EPISODE PURPOSE Drug use and abuse is increasing at an alarming rate, and the people involved are driving motor vehicles. Some of these individuals fail to understand the drug-driving hazard, while others possess the knowledge and decide to assume the risk. In any case, the problem is a challenge, and driver education offers an excellent opportunity to inform young people about the effects and possible consequences of combining drugs with driving. This episode responds to that challenge.

Concepts	Supporting Principles	Behavioral Objectives
2.1 General Types	Drugs are of two general types.	*Cognitive* Distinguish between the two general types of drugs and indicate how either can influence highway safety.
2.2 Drugs and Medicines	Different drugs have different effects on body functions — all detrimental to driving performance.	Identify specific kinds of drugs, their effects on body functions, and possible consequences for the motor vehicle operator.
2.3 Guidelines	Little scientific evidence exists to illustrate how drugs and medicine (with the exception of alcohol) might contribute to, prevent, or cause highway accidents, but simple analysis indicates uncontrolled use can harm the health of the user and make it unsafe for him to operate a motor vehicle.	Formulate a set of personal guidelines for avoiding harmful highway consequences of drug misuse.
		Affective Adopt guidelines for avoiding the harmful driving consequences of drug misuse.

Learning Activities	Evaluation
Discuss drugs and driving. The main effort should be to present known facts about each drug and explore the influence it has on the operator's human functions related to driving.	*Cognitive* Use an objective test to determine if the student has acquired the basic facts about drugs. Having the student list the results he expects from combining drugs with driving may show his awareness of the problem, but may not indicate his feelings toward it. *Affective* The student's permanent record might reveal true convictions on drug use. An individual inventory of values and beliefs might also indicate if guidelines have been developed.

Resource Information

2.1 *General Types*

a. Some drugs may be sold over the counter without a doctor's prescription.

(1) The law insists they bear adequate directions for use. If used as stated in the directions, they are not dangerous to the driver.

(2) Because one tablet helps, two tablets will not necessarily be more helpful. Two tablets could affect the nervous system, reduce alertness, and impair driving performance.

(3) A common drug like aspirin can be fatal if taken in large quantity.

b. Another group of drugs can be dispensed only with a doctor's prescription.

(1) The doctor indicates directions for use that should be followed exactly to accomplish their purpose and to prevent dangerous side effects.

(2) The brain is the first organ in the body affected by excess drugs. Ability to function, to be alert, and to see and prevent dangers is often destroyed.

2.2 *Drugs and Medicines*

a. Narcotics (morphine, cocaine, and heroin) are the most powerful and dangerous drugs.

(1) In extreme cases, they are prescribed to relieve pain from disease, trauma, and burns.

(2) They have a depressant effect on the central nervous system that produces drowsiness, inability to concentrate, impaired vision, and sluggishness. At the same time they induce either euphoria or apathy.

(3) Usually narcotics are habit-forming. When the supply is cut off, serious and painful withdrawal symptoms may develop.

(4) Drug addicts drive automobiles with possibly hazardous consequences.

b. Marijuana ("reefers," "pot," "loco weed"), a natural drug rolled in cigarette paper and smoked, dangerously affects the driver.

(1) In the early stages, the user may appear animated and hysterical. While in the later stages, sleepiness and stupor result.

(2) In large quantities, it may induce hallucinations and a mood fluctuating from joy to extreme fear or panic.

(3) Marijuana intoxication does not impair motor coordination rapidly, however, a user may operate a car while his concepts of time and space (depth perception) are radically distorted.

c. Amphetamines ("bennies," "pep pills," "co-pilots") are used to treat certain illnesses and to control obesity. When carelessly used, they can be a threat to highway safety.

(1) They have a stimulating effect on the nervous system, increasing alertness and efficiency for a short time.

(2) Headache, dizziness, irritability, decreased ability to concentrate, and marked fatigue may follow.

(3) Operators may see things in the road that are not really there — mirages or hallucinations.

(4) Operators should know excessive, unsupervised use arrests drowsiness and fatigue, causing the driver to use reserved body energy until a total and sudden collapse may occur.

(5) Amphetamines can be sold legally in drug stores with a doctor's prescription, but they are bootlegged and sold for enormous profit to truck drivers and young people.

d. Barbiturates (sleeping pills, "goofballs," "candy," "barbs") calm nervousness and produce sleep. However, uncontrolled use can have serious consequences.

(1) They are habit forming and sometimes lead to true narcotic addiction; therefore, they may not be sold legally without prescription.

(2) The natural tolerance for barbiturates varies from person to person. Greater tolerance does not preclude addiction.

(3) Excessive use produces symptoms similar to alcoholic intoxication (drowsiness, confusion, inability to coordinate muscular actions, difficulty in thinking or talking clearly).

(4) Even the occasional user will become drowsy and less alert. This reduces the driver's ability to identify, predict, decide, and act.

(5) They should not be used except under a doctor's instructions and never while driving.

e. Tranquilizers are muscle relaxants, affecting some reflexes to relieve mental apprehension.

(1) Relatively mild compared to barbiturates, they can, with excessive repeated dosages, result in sedation to the point of dizziness, drowsiness, and blurred vision.

(2) Physical dependence can develop if used excessively.

(3) They fall under the federal prescription drug laws, although some preparations are compounded in small amounts with other substances and sold without prescription.

(4) Even those sold over-the-counter, such as inhalers, may have such a depressant effect on the central nervous system that driving performance will be dangerously impaired.

(5) They are particularly dangerous when used with other drugs or alcohol (synergistic effects).

f. Antihistamines used to relieve nasal congestion due to colds and allergies, can also seriously impair the ability to operate a motor vehicle.

(1) They have a depressant effect on the central nervous system.

(2) They may cause inattention, confusion, and drowsiness.

(3) Effects vary and are unpredictable. One person feels nothing; another is overcome with the desire to sleep; and another suffers genuine hallucinations.

(4) Some preparations containing a quantity of antihistamines compounded with other substances may be sold without prescription.

g. A number of other available drugs should either be used intelligently or avoided entirely by highway users.

(1) Dramamine, widely prescribed for motion sickness, may cause drowsiness, dull mental alertness, and slow reaction time.

(2) Penicillin and sulfanilamides like streptomycin may cause abnormal and violent reactions.

(3) Weight reducing preparations may cause dizziness and drowsiness.

(4) Glue sniffing produces immediate symptoms similar to those associated with alcohol intoxication, while a second stage produces drowsiness, stupor, or, in some cases, unconsiousness.

(5) LSD and other hallucinogens primarily affect the central nervous system, producing changes in mood and behavior and upsetting the user's perception of reality. Perceptual changes involve sight, hearing, touch, body-image, and time.

2.3 *Guidelines* (p. 42; DLM)

a. Under medical supervision, drugs are useful in treating certain illnesses, but about one half of the millions of capsules and tablets manufactured annually are sold illegally. (Organized crime rings bootleg them.)

b. Drugs may cause a change in an individual's physiological state and impair his ability to drive.

c. Some people use drugs for the side effects or for reasons other than those intended. Drivers use them to keep awake.

d. The combined effect of drugs and alcohol equals more than one-plus-one, and this is true also of other combinations of drugs. One drug intensifies the effects of the other in a synergistic effect.

e. Drugs like alcohol first affect the higher brain and nerve centers that control reason, judgment, self-control, and normal inhibitions, rendering the person incapable of evaluating his fitness for driving.

f. What to do about drug use and driving is an individual decision, but the responsible person considers the consequences of misuse and avoids any risky combination of drugs and driving.

Part III Readiness Tasks
Unit A Operator Fitness
Episode 3 Emotions and Motivations

EPISODE PRINCIPLE Self-discipline and self-control eliminate the dangerous effects of strong emotions on and inappropriate motivations for driving.

EPISODE PURPOSE Response to the traffic environment depends on the driver's emotional state and skill as well as his reason for driving. Because the environment is replete with frustrating situations that can induce strong emotions, the driver needs to learn how to cope with these frustrations so the disturbance is minimized. This episode is directed to that end.

Concepts	Supporting Principles	Behavioral Objectives
3.1 Emotions and Driving Behavior	Emotions (fear, love, hate, anxiety, joy, excitement) have a profound effect on behavior in general and driving in particular.	*Cognitive* Summarize the nature and effects of emotions on motor vehicle operators.
3.2 Handling Emotions	Accident potential is not related to the degree emotional problems beset operators (emotional upsets are an inevitable and natural consequence of living) but rather to the effectiveness of the methods used to handle or cope with these problems.	Formulate personal guidelines for anticipating and handling situations likely to induce strong emotions and unsafe behavior.
3.3 Motivations for Driving	Motivation for driving influences a person's behavior as an operator.	Classify the needs operators try to satisfy on the highway and indicate the type of behavior likely to result from these needs. Suggest safer and more productive alternatives to satisfy them. *Affective* Control his emotions as he drives and when he stops driving.

Learning Activities	Evaluation
1. Discuss behaviors that may lead to serious trouble while driving (preoccupation, inattention, forgetfulness, day-dreaming). 2. Cite situations like tailgating, sudden stopping, and failure to signal, evoking strong emotional response. Explore ways of overcoming these feelings. 3. Have students list reasons why man invented the automobile and ways he has continually adapted it to suit him.	*Cognitive* Create frustrating experiences in the driver education car and observe the student's ability to cope with these situations. *Affective* Observations in laboratory experiences may reveal the student's emotional maturity level.

Resource Information

3.1 *Emotions and Driving Behavior*

a. A single emotion is a strong feeling typically involving both mental and physical responses.

(1) Emotions effect the part of the brain (cerebrum) controlling thought, reason, and judgment as alcohol does.

(2) Strong emotions affect certain bodily changes: heart beats faster; face flushes; breathing speeds up; blood pressure rises; and muscles become tense.

(3) Repeated extreme emotion may affect digestion and appetite, cause chemical changes, or lead to ulcers.

b. Most emotions are temporary, but emotional habits sometimes develop.

c. The mental state of the driver frequently influences his performance. He may be:

(1) worried about an examination;

(2) depressed or elated about the outcome of an athletic contest;

(3) upset about an argument with a friend; or

(4) angry because of a restriction imposed by parent or teacher.

d. The distracting and paralyzing effect of strong emotions, whether they originate before or during the trip, can:

(1) dim or "blind" powers of observation;

(2) delay or distort ability to interpret events;

(3) reduce power to assess and predict the actions of other highway users;

(4) produce faulty judgment and high risk decisions; and

(5) adversely affect ability to perform precise and properly timed skills.

e. Emotions are contagious and can influence others, setting up a chain reaction.

f. Emotions can affect driving behavior positively.

(1) Reasoned fear of accident or legal punishment restrains unsafe tendencies.

(2) Love for family and friends motivates a person to drive safely.

g. Laws cannot control emotions, but laws do relate to behavior that results from uncontrolled emotions such as speeding and failure to yield.

h. Developing the rational and emotional centers of the brain is a life process young people have only begun.

(1) They are inclined to be more erratic in temperament, more subject to extremes, and more likely to let their emotions drive the car.

(2) Emotional maturity, however, is not necessarily related to chronological age.

3:2 *Handling Emotions*

a. Driving proficiency can be increased by evaluating emotional fitness to drive and:

(1) putting aside the problems that tend to distract attention;

(2) waiting until the strength of the emotion subsides before assuming the driving task; and

(3) selecting an alternative means of reaching the destination, if emotions are too strong to drive safely.

b. The potential hazard of traffic-induced frustrations can be minimized by examining irritating situations and:

(1) insofar as possible avoiding them by thoughtful planning; and

(2) deciding in advance how to handle frustrating situations.

c. Since driving mistakes are common to all people, empathy for other highway users can increase tolerance of their mistakes and decrease irritation.

d. Driving under severe emotional stress should be avoided, for it may have serious consequences.

3.3 *Motivations for Driving*

a. The vehicle can satisfy personal needs such as the need to:

(1) escape from parental control;

(2) socialize and date;

(3) prove maturity;

(4) gain attention, power, and influence;

(5) explore and experiment; and

(6) act out tensions.

b. With a few exceptions these motivations for driving are natural and healthy signs of maturing, but the operator must not permit the motivation for driving to interfere with his proficiency.

(1) The pleasure and exhilaration of driving

with friends can be distracting to the operator.

(2) Frustration caused by unmet personal needs such as status within a group, achievement, recognition, or affection can cause aggression, hostility, impulsiveness, competitiveness, and showing-off with the automobile as the instrument.

(3) To gain status and security within a preferred group, an individual usually conforms to group norms involving driving.

(4) The knowledge that one has been entrusted with an adult responsibility can be a strong incentive to drive properly.

Part III Readiness Tasks
Unit A Operator Fitness
Episode 4 Other Impairing Factors

EPISODE PRINCIPLE In most cases, handicaps imposed by physical limitations or disabilities can be compensated for so a person can operate a vehicle competently.

EPISODE PURPOSE The extent of highway hazards created by physically and mentally impaired drivers largely depends on the individual operator recognizing and compensating for his impairments. Several impairments are due to natural limitations of the body while others are due to physical or mental handicaps. This episode deals with ways to compensate for these impairments.

Concepts	Supporting Principles	Behavioral Objectives
4.1 Causes of Fatigue	Fatigue is a complicated biological reaction to prolonged or intense physical and mental activity.	*Cognitive* Identify the causes of fatigue.
4.2 Effects of Fatigue	Fatigue causes physiological changes reducing the body's performance. This, in turn, impairs the operator's ability to function effectively.	Predict the effects of fatigue on human functions and operator's performance.
4.3 Handling Fatigue	Certain measures can delay the onset of fatigue while driving, can compensate for the effects of fatigue already present, or can alleviate an extreme state of drowsiness.	Formulate personal guidelines for minimizing the danger of accidents induced by fatigue.
4.4 Carbon Monoxide	Carbon monoxide poisoning can be prevented by using what is known about the source and nature of the poison as protection from this danger while operating a motor vehicle.	Identify the (1) source of carbon monoxide, (2) effects on body functions and operator performance, (3) conditions increasing chances of carbon monoxide poisoning, and (4) precautionary measures.
4.5 Physical Defects	A person free of physical defects is potentially a competent driver. Having a chronic disease or impairment, however, does not necessarily seriously interfere with driving.	Identify physical handicaps for which effective means of compensation are available (in motor vehicle operation).
4.6 Age Factors	Young operators can increase their own safety and that of all highway users (particularly the elderly) by understanding the difficulties the aged have in driving.	Summarize the major points related to the question: How valid is calendar age as an index of driving competence?
4.7 Control Measures	Legislators and motor vehicle authorities, who are responsible for prescribing and implementing physical and mental standards for driver licensing, must rely on the cooperation of the medical profession and of the general public.	Describe the problems and promising solutions related to the physical and mental standards for driver licensing
		Affective Accept that physically and chronologically handicapped drivers can be competent drivers.

Learning Activities

1. Have the students answer the following questions:

(1) What are the different causes of fatigue and how might they affect operational performance?

(2) How can one best delay the onset of fatigue while driving?

(3) How can one best compensate for fatigue already present?

2. Organize a panel discussion on the pro's and con's of young drivers between the ages of 18 and 25 and older drivers between 25 and 55. The panel can discuss these topics:

(1) Psychological differences

(2) Youth versus experience

(3) Age as opposed to sex factors

(4) Accident ratio between young and older drivers.

2. Have a class discussion on the driver licensing of handicapped students in Massachusetts. Bring in handouts listing physical and mental standards for licensing drivers in other states. Compare Massachusetts licensing practices with those of other states.

Evaluation

Cognitive

Objective testing of the facts about fatigue and carbon monoxide will determine if objectives have been achieved.

Lists things to do if he must continue driving when fatigued.

Identifies the age group most likely to have selected handicaps.

Affective

Is not impatient with aged drivers or other drivers who are overly cautious near the driver education car.

Resource Information

4.1 *Causes of Fatigue*

a. Fatigue is induced not only by inadequate sleep or rest and physical work but also by extensive study and thought.

b. Psychological (emotional) stress or even boredom can also cause fatigue.

c. Fatigue accompanies illness, because the body needs energy to combat the disease.

d. Sun glare is a major cause of eyestrain, leading to fatigue and drowsiness.

e. Overeating, alcohol, drugs, excessive heat, and carbon monoxide compound the effects of fatigue.

f. Driving is a learned skill affected by fatigue; moreover, driving is a tiring activity (particularly monotonous, uninterrupted driving).

4.2 *Effects of Fatigue*

a. Effects of fatigue on an operator's performance are similar to those of alcohol and drugs and frequently are associated with them.

b. Effects of fatigue are:

(1) narrowed visual field;

(2) impaired sensory acuity;

(3) delayed and distorted perception; (Perceptual skills have been demonstrated to deteriorate more than motor skills after prolonged driving.)

(4) impaired ability to judge and predict;

(5) delayed decision-making and reactions; and

(6) reduced control and timing of neuromuscular skills.

c. Because of these effects, a fatigued operator is more likely to:

(1) ignore or fail to recognize critical elements in the traffic environment;

(2) be affected by glare;

(3) misjudge the speed or distance of another vehicle;

(4) take a chance in passing;

(5) become irritable, discourteous, over-react; and

(6) act clumsily or impulsively while maneuvering the vehicle.

d. Unfortunately, an operator may not recognize his driving has deteriorated because of fatigue.

e. Fatigue, particularly when caused by sleep deprivation, is accompanied by drowsiness.

f. Some tired drivers get "foot heavy" and drive at excessive speeds without realizing it. Others slow down to a dangerous and illegal speed on freeways and in tunnels.

g. Extremely fatigued operators have been known to experience hallucinations and to swerve or brake suddenly to avoid obstacles not actually present.

h. A collision involving a driver who has fallen asleep involuntarily usually lacks skid marks or evidence of evasive action prior to impact.

4.3 *Handling Fatigue*

a. Fatigue and drowsiness should be heeded even though arrival time is delayed.

b. To help maintain mental alertness and avoid the onset of fatigue on long trips, the driver should:

(1) start the trip refreshed;

(2) keep his eyes moving;

(3) wear good sunglasses in bright sunlight;

(4) avoid heavy foods and alcoholic beverages;

(5) keep the car well ventilated; and

(6) stop periodically for rest and light exercises.

c. When extremely tired or drowsy, he should:

(1) let someone else who is wide awake drive;

(2) stop in a safe place, turn off the ignition, lock all doors, and take a nap as a temporary measure. (Most modern freeways have well protected rest and parking areas.)

4.4 *Carbon Monoxide*

a. The major source of carbon monixide is automobile exhaust.

(1) When fuel is incompletely burned, carbon monoxide results.

(2) An automobile engine produces enough carbon monoxide to make a closed garage deadly within five minutes.

(3) Exhaust control devices, required on new cars, have reduced carbon monoxide emissions.

(4) Carbon monoxide from smoking cigarettes in a closed automobile can reach a dangerous level.

b. Carbon monoxide causes oxygen starvation in the tissues.

(1) Combining with the hemoglobin in the red corpuscles, it reduces the oxygen-carrying capacity of the blood and causes tissue starvation.

(2) Oxygen starvation affects the brain and heart and may cause death within minutes.

c. In addition to the concentration of carbon monoxide in the air, another major factor is the length of exposure.

(1) Long exposure to low concentration is likely to be more serious than shorter exposure to a higher concentration because the effect is cumulative.

(2) As little as one in one thousand parts of air breathed for 90 minutes can be fatal.

(3) Repeated exposure to carbon monoxide results in increased susceptibility and can cause cumulative damage.

d. Carbon monoxide is not evident to the senses (colorless and odorless), so if the concentration is high, a person might lose consciousness without any warning. But symptoms may appear if the carbon-hemoglobin level builds up gradually.

(1) Tightness across the forehead is followed by throbbing in the temples.

(2) Headache, weakness, dizziness, nausea, loss of muscular control, and increased pulse and respiration rates are common symptoms.

(3) Symptoms multiply rapidly as the level increases, resulting in dimness of vision, severe nausea, fainting, coma, and finally death.

e. Carbon monoxide poisoning is a prime suspect in many automobile accidents.

(1) Carbon monoxide in the blood may aggravate or intensify normal driving fatigue and drowsiness, thus contributing to one-car accidents particularly.

(2) The amount of carbon monoxide in the blood of a driver is linked directly with increased reaction time and with decreased ability to judge time, distance, or differences in speed between his car and another.

(3) Many people are found dead in parked automobiles with the ignition on, the gas tank empty, and the battery dead.

f. Certain weather, vehicle, and driver conditions increase the chances of carbon monoxide poisoning.

(1) The danger of carbon monoxide poisoning is increased in hot humid weather.

(2) Snow around the car may "pocket" the gas and cause it to seep into the car.

(3) Children and adults with physical defects such as bronchitis, asthma, overweight, alcoholism, and chronic ear disease are particularly susceptible to carbon monoxide.

(4) Poor ignition and faulty carburetor adjustment may also contribute.

(5) Loose exhaust pipe or manifold connections, a cracked exhaust manifold, a leaky muffler (not necessarily noisy) or tail pipe are prime sources of trouble.

(6) New engines produce as much carbon monoxide as old engines, but older cars are more likely to have leaks in the exhaust system.

(7) The slower the speed the greater the amount of carbon monoxide produced by automobiles. (Freeways during commuting hours are especially dangerous.)

g. If certain precautionary measures are followed, the danger of carbon monoxide poisoning is minimized. The driver should:

(1) keep a window partially open at all times for proper ventilation;

(2) close air intakes temporarily when travelling in slow moving traffic or in tunnels and shut off the engine when stops are longer than a minute;

(3) always keep the garage door open when the vehicle is inside and the engine is running;

(4) never drive with the trunk open even slightly or with the rear window down in a station wagon, because suction can bring exhaust gas into the passenger compartment;

(5) replace muffler or tail pipe if clogged or damaged by corrosion and have bent or broken exhaust pipe straightened, repaired, or replaced;

(6) if any holes are drilled in the firewall to install accessories, be sure the firewall is sealed adequately; and

(7) do not place children on the car floor to sleep.

h. Revival is possible by artificial respiration, by application of oxygen, and by keeping the victim cool to reduce oxygen demand.

4.5 *Physical Defects*

a. Sometimes a compensating operator performs better than a normal person. A number of states report better driving from persons with defective hearing than from those with normal hearing.

(1) Deaf drivers often have proper seeing habits and well developed perceptions of potential driving hazards.

(2) Full concentration on driving is possible with absence of radio and conversation.

(3) Deaf drivers are generally more aware than the great mass of hearing drivers that a driver's license is a privilege to be respected and guarded.

b. Persons with recently acquired impairments lack the compensating or adjusting ability of those who have long had the same impairments. Therefore, a person must drive with considerable caution if he suddenly acquires a visual or hearing defect, an injury, or some other disability that interferes with driving.

c. Advances have been remarkable in equipping the vehicles of orthopedically disabled persons so they can drive safely. Some drive with only their arms or feet.

d. Medically controlled epileptics and diabetics perform adequately in virtually all activities of life including driving.

e. If physical fitness were the only requisite for competent driving, the young driver would have the best record.

4.6 *Age Factors*

a. The aging driver is steadily becoming a more important consideration, because his number is growing faster than the total number of drivers.

b. Most older drivers want to continue driving as long as they are capable, and public policy should be based on helping them continue to drive enjoyably and safely.

c. Chronological age is as poor an index of aging as of driving competence.

(1) The important element is not the calendar but the functional age of the individual.

(2) Some can still drive safely in all traffic at age 80, while others might be unable to drive safely at age 60.

(3) Functional or pathological age (deterioration of the body) and calendar age do not necessarily coincide, because pathological age is individually determined.

d. The physiological and behavioral effects of aging impair man's skill as a driver but added experience and safety-mindedness tend to offset the deterioration.

e. Older drivers and pedestrians rarely consciously court danger, speed, or drive dangerously faulty cars. They are, however, involved in unsafe situations and accidents caused by inefficient sensory-motor capabilities and unfamiliarity with modern highway facilities and traffic controls.

(1) Common errors of older drivers are: improper turning, failure to give right-of-way, ignoring stop signs, and improperly entering and leaving the highway.

(2) A high percentage of pedestrian fatalities involve people over 65 years of age.

f. Older persons often experience the hostility of youth, and they tend to respond with hostility, hate, fear, or aggressiveness.

g. The deteriorating process of aging is so gradual the effects may not be recognized, or the individual may recognize his limitations and fail to admit them for fear of losing his driving privilege.

h. Young operators can help the situation by:

(1) empathizing with and compensating for elderly highway users to avoid compounding their problems;

(2) tactfully educating elderly family members about modern traffic conditions;

(3) helping authorities find and eliminate incompetent drivers; and

(4) supporting efforts to protect the driving privilege of many elderly drivers who continue to function efficiently.

4.7 *Control Measures*

a. One of the major obstacles to an effective driver licensing program is the difficulty of licensing authorities in identifying unfit operators.

(1) A person without significant impairment today may be disabled tomorrow.

(2) Operators tend to conceal a disability that might cause them to lose their driver's license or to have it restricted.

(3) Routine physical examinations, although revealing, are not infallible means of detecting conditions that will interfere with operator performance. For example, epilepsy, mental disorders, cardiovascular disorders, and many other health problems are difficult to identify in a routine examination.

(4) Licensing authorities must communicate with and seek the cooperation of other state agencies that can identify persons with disabilities.

(5) Periodic reexaminations of drivers can help with the identification problem.

b. The medical profession can effectively counsel individual patients and licensing authorities on operator fitness.

(1) A physician who examines or treats a patient is in the best position to know and advise him about impairments that interfere with driving performance.

(2) The traditional doctor-patient relationship raises the question about the doctor's responsibility when he recognizes a disability in a patient that impairs the patient's ability to drive.

(3) In some jurisdictions, medical advisory boards have provided licensing authorities with professional medical knowledge to help them make decisions on licensing regulations.

(4) So little pertinent research has been done that, except for glaring physical defects or gross deficiencies, it is not always known which physical impairments, disabilities, or diseases make an operator incompetent.

(5) The medical profession, given the resources, can conduct research to discover what should be included in driver licensing examinations and other standards. In the absence of any group medical specialists trained to deal with the operator and his tasks, a rather permissive situation exists.

c. Since driver licensing officials cannot always know the physical and mental condition of motor vehicle operators, the highway system depends considerably on the individual operator evaluating his fitness to drive.

d. Because the public and thus the legislators will be directly affected, any official restricting of the driving privilege needing public support will encounter difficulties. (How much freedom will the public give up for safety?)

Part III Readiness Tasks
Unit B Vehicle Readiness
Episode 1 Vehicle Sub-system — Prerequisite Knowledge

EPISODE PRINCIPLE Power, available to the driver via the accelerator pedal, is made possible in the internal combustion engine by the interaction of fuel, electric, lubricating, and cooling systems.

EPISODE PURPOSE How much the driver must know about his vehicle is unresolved at this time. Almost everyone would agree drivers need neither be thoroughly knowledgeable, nor completely ignorant of a vehicle's mechanism. The answer lies somewhat between these two extremes.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Power Source	The burning of a gasoline-air mixture in an enclosed space (cylinder) is the source of power.	*Cognitive* Given a diagram of the power train, trace the power from the engine to the rear wheels while describing the function of the major parts.
1.2 Power Train	The power developed by the engine is transmitted to the drive wheels via the power train.	Given a diagram of the cylinder combustion chamber showing piston, spark plug, valves, and connecting rod, describe how the fuel and electrical systems interact to create power.
1.3 Lubricating and Cooling Systems	Lubricating and cooling systems are needed to keep the engine and power train functioning. In addition to the heat created by the burning of fuel, moving metal parts create friction that produces heat within the engine.	Summarize how the lubricating and cooling systems keep the engine going.

Learning Activities	Evaluation
Classroom instruction time should be limited on this episode, since the knowledge can be acquired independently assuming the material is well programmed and illustrated. Moreover, some students will have learned about the automobile's mechanism in other courses or in experiences outside of school. (The internal combustion engine is now studied in elementary school science.)	*Cognitive* Names from schematic diagrams parts of the power train and the cooling and lubricating systems. Identifies the purpose of each part of the power train.

Resource Information

1.1 *Power Source*

a. A fuel pump draws gasoline (potential energy) from the storage tank and delivers it to the carburetor, where it is atomized and mixed with air to form a combustible vapor. Two filters are involved in this process.

(1) A filter in the gasoline line between the tank and the carburetor removes dirt, rust, scale, moisture, and other harmful particles.

(2) Protecting carburetor and cylinder parts, an air filter mounted above the carburetor removes impurities from the staggering amounts of air required to operate the car.

b. From the careburetor, the combustible vapor is drawn into a closed (except for intake and exhaust valves) cylinder with a close fitting piston, where fuel and electrical systems combine to convert heat energy of expanding gases into mechanical energy.

(1) Vapor is compressed in the cylinder by piston action and ignited by a spark plug that causes instantaneous burning. The resulting action thrusts the piston down.

(2) The downward thrust of the piston is converted into a rotary motion, a twisting force called torque, by the crank shaft attached to the piston.

(3) Most vehicles have four, six, or eight cylinder-piston combinations, each exerting a downward thrust at a different instant. This arrangement provides continuous and smooth power production.

c. The battery stores electricity, supplying current to start the engine and to operate the accessories.

(1) When the ignition and the starter switch (usually combined) are turned on, electricity flows from the battery to a small electrical starter motor that spins and cranks the engine.

(2) A generator or alternator, turned by the fan belt, provides current when the engine is running and keeps the battery charged. (A voltage regulator prevents overcharging and undercharging.) The ammeter light or needle tells whether the current is flowing out or into the battery.

1.2 *Power Train*

The twisting force of the crankshaft is transmitted to the rear wheels via the:

a. Clutch — connects and disconnects the flow of power from the engine to the rear wheels.

b. Transmission — changes speed and power.

c. Driveshaft — transfers power from the transmission back to the differential that transmits it to both wheels.

d. Universal joints — provides a flexible joint so power can be delivered while the differential is bounding up and down from road shock.

e. Differential — transmits at a right angle the twisting force of the driveshaft to the axle shafts and allows the rear wheels to turn at different speeds when cornering.

1.3 *Lubricating and Cooling Systems*

a. Motor oil from the crankcase is pumped throughout the engine to:

(1) prevent metal to metal contact;

(2) collect contamination like exhaust gases and products resulting from burned gasoline; and

(3) serve as a seal between cylinder and piston walls.

b. Oil does not wear out, but contamination can build up to dangerous proportions. Thus, oil must be filtered and changed periodically.

c. Some parts of the engine would quickly destroy themselves if much of the heat were not removed in a cycle of continuous cooling. The cooling is performed by coolant continuously circulating around hot interior parts to absorb heat and then flowing to the radiator where incoming air carries the heat away.

d. A fan belt turns the fan pulling an air stream through the radiator and turns the water pump circulating coolant through the system. A thermostat aids in maintaining a range of temperature conducive to efficient engine operation.

Part III Readiness Tasks
Unit B Vehicle Readiness
Episode 2 Vehicle Management — Selection and Maintenance

EPISODE PRINCIPLE A competent vehicle owner will select a vehicle appropriate for his needs and preserve its efficiency with preventive and corrective maintenance at minimum cost.

EPISODE PURPOSE This episode aims to increase the student's ability to make informed decisions about vehicle maintenance and selection. Major emphasis is placed on signs and symptoms of vehicle malfunction, probable cause and consequence if not corrected, and how to prevent the trouble in the first place. Attention is also given to safety and cost factors to be considered in selecting the most appropriate vehicle and equipment options for a given set of objectives and operating conditions.

Concepts	Supporting Principles	Behavioral Objectives
2.1 Owner Responsibility	Each owner must assume responsibility for the maintenance of his vehicle; furthermore, it is to his advantage to do so.	*Cognitive* List reasons for maintaining a vehicle properly.
2.2 Signs and Symptoms	Vehicles seldom develop mechanical problems without warning. Early identification and correction of symptoms are important.	Match various mechanical problems with the means of detecting the problem.
2.3 Preventive Maintenance	Since instruments, gauges, and other signs cannot signal every trouble in advance, and since changes in vehicle performance may occur so gradually the driver fails to recognize them, preventive maintenance is important.	Given a list of vehicle components such as cooling system, battery, and tires, list the periodic checks necessary to maintain efficient and economical operation.
2.4 Operating Conditions	Operating conditions make a difference in the need for vehicle maintenance.	Given various operating conditions, state the implications they have for a vehicle maintenance schedule.
2.5 Service Agency Selection	Most important for any maintenance program is to choose a service agency (automobile dealer, independent garage, or gasoline station) with reliable mechanics; otherwise, money will be spent for unnecessary or substandard repairs.	Formulate criteria and guidelines for selecting and dealing with a service agency.
2.6 Vehicle Selection	Selecting and owning a vehicle must be treated as serious business.	Given a case study of a young person with specific needs and resources who purchased a car, identify his good and bad decisions (steering, brakes, power, style, cost, payments). *Affective* Question various vehicle malfunctions and preventative maintenance practices.

Learning Activities	Evaluation
1. Students can discuss from personal experience instances of poorly maintained vehicles causing accidents. 2. Given a list of symptoms, students identify the mechanical problems and list the corrective procedures. 3. In groups, students devise a periodic maintenance checklist, referring to family automobile maintenance manuals. 4. Discuss the advantages and disadvantages of various service agencies for a vehicle maintenance program. 5. Have the students list possible sources of information helpful in selecting a reliable service agent. 6. A classroom interview with a person from the local Chamber of Commerce or Better Business Bureau can help students to become aware of the common swindles used by dishonest automobile mechanics to victimize the public. The interview should deal with protective measures students can take.	*Cognitive* Give an object test to test behavioral objectives. Given a case study of a car buyer, student analyzes the case and identifies the good and bad decisions made by the purchaser. *Affective* Visits a garage or school auto shop; stops after class or school to raise questions; discusses concerns with peers; and reads the car owner's manual.

Resource Information

2.1 *Owner Responsibility*

a. Proper maintenance of the vehicle increases the probability of reaching the destination safely, conveniently, and economically.

b. Letting the vehicle deteriorate can lead to:

(1) poor performance;

(2) breakdowns;

(3) accidents;

(4) excessive repair bills;

(5) less mileage per gallon of gasoline or quart of oil;

(6) conviction for traffic violation; and

(7) lower resale value.

2.2 *Signs and Symptoms*

a. Understanding how vehicles work makes it easier to recognize signs of trouble and describe them accurately to a mechanic so he can find and correct the difficulty.

b. Vehicle malfunctions can be detected by an abnormal "feel" in the control devices, by abnormal sounds and odors, and sometimes by sight.

(1) Engine troubles can be determined by the way the engine starts, idles, accelerates, or sounds; by excessive oil consumption that usually indicates piston and ring defects; and by the color of the exhaust smoke. Black or blue smoke usually signifies the need for carburetor adjustment or engine overhaul.

(2) Trouble with engine temperature, oil pressure, or battery charging can be observed on the warning lights or gauges.

(3) Sudden battery failure results in inability to start the engine.

(4) The way the brake pedal feels (soft or spongy, hard pressure required, falls away under foot pressure), sounds (squeal, click, rattle, or chattering), or causes the vehicle to respond (grabbing, overheating, pulling to one side, or failure to release or to hold) can signal failure or malfunction.

(5) Problems in the steering and suspension systems are usually revealed by the steering wheel (shimmy, free-play, pulling to one side, hard steering, poor return from turns, and temporary loss of power assist), by hard or rough riding qualities, by tire squeal on turns, by other noises from the steering or suspension systems, by one wheel sagging, or by irregular tire wear.

(6) Uneven or excessive tire wear may also indicate a need to correct tire pressure or driving habits.

(7) Clutch and transmission problems are revealed by the feel of the clutch, by sounds and touch when shifting, by a noisy transmission, or by lubricant leaks from the transmission.

(8) Some other signs of a problem requiring attention are oil or water leaks, poor gasoline and oil mileage, dim lights, and irregular flashing of the turn signal.

2.3 *Preventive Maintenance*

a. Preventive maintenance is checking and correcting a vehicle's condition regularly to catch wear or damage before it causes trouble.

b. Brakes wear out imperceptibly. Shock absorbers gradually lose their effectiveness, causing the car to wander before the driver recognizes the hazard. Exhaust systems can fail undetected, allowing carbon monoxide to permeate the vehicle.

c. A periodic check of the following increases the safety and efficiency of an automobile:

(1) cooling system — coolant level and condition, radiator hose (has a limited lifetime due to water and heat);

(2) battery — electrolyte level; external condition of battery and cables for damage, cracks, warped case, and corrosion (removed with soda solution and petroleum jelly applied on post and cables to prevent further corrosion), battery carrier and hold-down clamps, fan belt tension, and conditions;

(3) tires, steering, and suspension systems — tire pressure should be tested and tires inflated when cold, condition of tires (wear, cuts, cracks, bulges, objects between the treads), wheel lug bolts or nuts, shock absorbers for unequal resistance, wheel alignment and balance;

(4) brake system — linings, shoes, drums, master and wheel cylinders, backen plates (mounting support for brake units and keep dirt out of the drum); and

(5) oil level and oil filters — correct oil level ("full" mark on the dip stick or slightly below), oil filter (must be removed to see if dirt and sludge

are present around the base of the refills, because the dip stick does not reveal the condition of the oil).

d. Operators of two-wheeled vehicles should frequently check chain play and lubrication, clutch and brake cable adjustment and lubrication, tightness of nuts and bolts, signs of metal fatigue, tire inflation and condition, and wheel spoke adjustment.

e. The car owner's manual furnishes guidelines on time and mileage spans for maintenance, particularly concerning:

(1) engine oil and changing oil filter;

(2) proper grade of gasoline;

(3) cleaning and replacing carburetor air filter (check for excessive dust, dirt, and oil at points of entry);

(4) servicing air conditioning and cooling system;

(5) power train maintenance;

(6) ignition system and spark plugs; and

(7) engine performance evaluation (tune up).

f. If the warranty on the vehicle systems is to be honored by the manufacturer, the owner must prove he followed the maintenance schedule in the manual.

2.4 *Operating Conditions*

a. Maintaining proper engine temperature (140° to 200° F) helps to throw off contamination of oil by acids and unburned gasoline. Proper engine temperature is facilitated by:

(1) a properly functioning engine thermostat;

(2) an open crankcase ventilating system; and

(3) avoiding short-trips and engine idling.

b Oil changes should be more frequent in cold weather, in dusty climates, and on short-trip driving.

c. Since they are used more often, brakes wear out faster in town than in open highway driving.

d. Tires are more likely to go flat in hot weather.

e. Freeway driving is a severe test for potentially weak points in the mechanism of a vehicle (tires or fan belt).

f. Certain driving practices are costly in gasoline consumption, tire wear, and car damage:

(1) excessive speed;

(2) quick starts and stops;

(3) fast turns;

(4) racing the engine;

(5) improper gear selection;

(6) striking curbs, chuck-holes, and obstructions; and

(7) misuse of clutch.

2.5 *Service Agency Selection*

a. An operator who is not mechanically inclined is limited in his ability to diagnose troubles, to evaluate proficiency of repairs, to judge reasonableness of costs, or otherwise to exercise sound judgment about repairs.

b. Because a repair facility is associated with a dealership does not insure competence, but the dealer's mechanics may be better trained in the intricacies of the particular make than those working for an independent garage or gasoline station.

c. Diagnostic centers with highly sophisticated electronic and mechanical testing equipment are springing up rapidly. (Work can be done at any garage.)

d. Although most automobile mechanics are honest, Americans are victimized by auto repair racketeers at a cost of millions of dollars annually. Common swindles include:

(1) padding the bills with unauthorized repairs;

(2) charging for parts never installed;

(3) outright shakedown of customers; and

(4) replacing whole units instead of components.

e. Nationwide mimimum standards for repair facilities and mechanics are needed.

f. To prevent victimization by dishonest repair and service people, the driver should:

(1) become familiar with what is under the hood of the car;

(2) never permit big repair jobs without prior consent;

(3) before work begins, get the prices in writing for all authorized repairs (not always possible);

(4) avoid strange garages or consult the nearest better business bureau or automobile club;

(5) ask in advance for the return of any parts replaced;

(6) when possible, tell the mechanic what is wrong; and

(7) demand an itemized bill.

2.6 *Vehicle Selection*

a. If a person purchases a vehicle beyond his financial means, he may not have the money for preventive maintenance.

b. The thoughtful buyer selects optional equipment according to reasons for purchasing the vehicle, driving conditions, safety, money available, and operation and maintenance (engine type and size, manual vs. automatic transmission, air conditioning, power vs. disc brakes).

c. Knowing indicators of good and bad used cars is essential when shopping for one.

Part III Readiness Tasks
Unit C Trip Plan
Episode 1 Trip Planning

EPISODE PRINCIPLE Trip planning is crucial to the driving task.

EPISODE PURPOSE Whether the trip is long or short, the operator must select a route, decide when to travel, and consider special equipment. Before leaving, he must determine if all is indeed ready for departure. Any neglect in this final pre-driving stage can result in inconvenience, frustrations, and unsafe conditions. This episode deals with the principles and practices of trip planning that reduce the demands on the operator once the trip is underway.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Alternatives to Driving	Is the trip necessary, and if so, does one need to drive?	*Cognitive* Given alternative means of travel (air, rail, bus, private car) and information about a situation, identify the advantages and disadvantages of each alternative.
1.2 Route Selection	By clearly identifying his destination and the best route to travel, the driver can avoid many frustrations and distractions.	When told the origin and destination of a long-distance trip, identify such things as the best route, times to travel, planned stops, and cost.
1.3 Time Factors	A key to trip planning is selecting the time to travel.	
1.4 Equipment	Equipment and preparation can help a driver and his passengers handle unusual or adverse circumstances such as weather, road surface, breakdown, illness, accident, and cost. Knowing what to expect and preparing for it are as important as knowing the road to travel.	Given conditions such as origin, destination, time of year, and people involved, prescribe the standard and special equipment needed.
		Affective Advocate principles of trip planning that reduce driving risks.

Learning Activities

1. Give each student a map and ask questions that can be answered by reading the map. Questions might pertain to route numbers, mileage, points of interest, type of road, street names, city locations, etc.
2. Have students use a chart to discover comparable cost, comfort, and travel time of various means of travel.
3. Use transparencies of sample trip tickets to trigger discussion of information available on a map.
4. Discuss effects of cramming for a test upon performance. Relate this to driving extended lengths of time.

Evaluation

Cognitive

Near the completion of the course, the student plans a short trip and drives there in the driver education vehicle.

Pre-driving habits can be evaluated during laboratory instruction. Other objectives can be evaluated by using the medium implied by the objective.

Affective

Practices trip planning principles before each lesson in the driver education car.

Resource Information

1.1 *Alternatives to Driving*

a. Sometimes people use their vehicle for other than transportation which may or may not be appropriate.

b. Car pools reduce the:

(1) number of vehicles needing road and parking space;

(2) opportunities for accidents — fewer vehicles mean fewer possible conflicts; and

(3) cost.

c. Public transportation has advantages.

(1) It is less expensive than driving if one person is travelling.

(2) Passengers can relax, read, work, or enjoy the scenery.

(3) Air travel, particularly on long trips, reduces travel time.

1.2 *Route Selection* (p 37; DLM)

a. The most direct is not necessarily the best route.

b. Sufficient preparation and proper navigation can often reduce travel time, irritations, and hazards.

c. A lost driver searching for a street name, house number, and other route information is a hazard. (Passengers can assist the driver in this.)

d. The route(s) for a trip should be memorized or written down, minimizing the necessity for slowing down to seek or study directional signs.

(1) At considerable expense and effort, automobile clubs, insurance companies, oil companies, highway departments, chambers of commerce, and other organizations provide free maps to help travellers in trip planning. Some plan trips and mark the best routes.

(2) Since changes occur daily in the highway network system, the traveller should use the most recent map obtainable.

(3) If a person is to interpret a map accurately, he must first become familiar with the symbols and markings (legend) on it.

e. Some considerations in selecting a safe, convenient, and economic route are the:

(1) length of journey;

(2) kind of highway (number of lanes — controlled, limited, or free access);

(3) volume of traffic;

(4) toll roads or bridges;

(5) potential trouble spots such as railroad crossings, congested access, unsignalized intersections with major highways, notoriously high accident locations, and difficult left turn situations;

(6) eating, sleeping, and refueling places;

(7) scenery and places of interest; and

(8) the nature of the vehicle. (Two-wheeled vehicles and trucks are unsuitable or illegal on certain routes.)

f. By watching for route signs, particularly after turns and on detours, the driver lessens the possibility of driving out of his way.

1.3 *Time Factors*

a. The starting and arrival time for a trip should allow a time cushion for service and rest stops, weather, traffic congestion, and other unexpected delays (flexible planning).

b. Hurried or overambitious drivers are generally impatient, taking chances and driving at excessive speeds.

c. Driving many hundreds of miles without bed rest is a common and dangerous practice. (Three hundred to 500 miles is a full day's drive.) Too often a quick roadside rest gives the long distance driver false confidence. Using a relief driver every two hours should be considered.

d. The environment may produce tension, but a personal deadline should not.

e. Relatively little time is gained by driving 75 mph compared to 65 mph.

f. Starting and stopping early on long trips helps to:

(1) avoid traffic;

(2) make it easier to find suitable lodging; and

(3) avoid night driving when navigation is more difficult.

g. Trip time and frustration can be reduced by avoiding cities, tunnels, bridges, and other known bottlenecks at peak periods of traffic. (Some cities have special traffic rules for these periods.)

1.4 *Equipment*

a. Properly functioning defroster equipment, along with disposable paper towels and a scraper, assist in clearing car windows (inside and out), particularly when a service station is unavailable.

b. Because rubber in windshield wiper blades eventually deteriorates and the pressure of the blades against the windshield may change, a periodic check is important.

c. Bad weather equipment, depending on the locality and the season, includes: a small shovel; reinforced tire chains; a bag, box, or bucket of sand or ashes; a blanket, burlap bags, or section of carpet; and a tow rope or cable.

d. High altitude affects drivers and vehicles. Thin air (low oxygen content) causes quick fatigue and impairs vision, judgment, and decision-making. Furthermore, engine horsepower declines at higher altitudes.

e. Being able to avoid extremes in temperature within the vehicle reduces driver and passenger discomfort, irritation, and fatigue. Air conditioning also reduces noise level for safety.

f. A properly inflated spare tire, a jack, and other tire-changing tools are essential.

g. A few basic tools (screw driver, wrench, hammer) may be all that are needed to correct a minor vehicle defect.

h. A first-aid kit can reduce discomfort and suffering in the event of illness or accident on a trip.

i. Special consideration should be given to entertaining small children in the vehicle, so they do not distract the driver. Someone other than the driver should supervise the children.

j. Pulling a trailer requires legal and safety precautions such as brakes, lights, hitch, and springs.

k. A flashlight and flares are particularly helpful if a car is disabled at night. The flashlight should be visible from 1,000 feet.

l. Although jumper cables are not a necessity, they could prove valuable in an emergency caused by a dead battery, especially for a car with automatic transmission.

m. A fire extinguisher is rarely needed, but the need is crucial if it does arise.

(1) Hundreds of thousands of automobile fires are reported annually.

(2) Approximately half the fires break out under the hood because of short circuits in the wiring.

(3) The best means for handling a fire is an extinguisher, but unfortunately few drivers carry one.

(4) In lieu of a fire extinguisher the driver can use a blanket, top coat, dirt, sand, snow or anything he can find to smother the fire quickly.

(5) If the fire is small and water is nearby, a hub cap can be used to carry water to the fire.

(6) If the fire gets out of control, people should move well away from the car because the gas tank may explode.

n. With travelers' checks and credit cards available, carrying large sums of cash is unnecessary.

Part IV Improvement Tasks
Unit A Self-improvement
Episode 1 Risk Acceptance

EPISODE PRINCIPLE Values, needs, and emotions influence the degree of risk a driver is willing to assume in driving (risk acceptance).

EPISODE PURPOSE Operator competence is marked by wise and responsible decision-making. This episode should help the student understand that this personal decision-making process, particularly with regard to risk, will build up internal standards of behavior. (These standards will be more effective than adult-imposed standards.)

Concepts	Supporting Principles	Behavioral Objectives
1.1 Risk Acceptance	Risk acceptance is influenced by comparing the risk to the potential gain. What is at stake, and what are the odds?	*Cognitive* Identify and appraise the considerations of motor vehicle operators (particularly youth) when assessing risks on the highway.
1.2 Individual Differences	Some operators are willing to assume a higher degree of risk than others.	Describe the reasons for individual differences in risk acceptance.
1.3 Group Influence	The desire for status and security in a group has a strong influence on risk acceptance.	Given a description of a social situation involving young drivers whose responses have been less than ideal, identify group influence on individual behavior and suggest more appropriate responses. The same objective could be applied with students using situations from their own experience.
1.4 Other Influences	The same operator may be willing to assume more risk at one time than another. Driving behavior, in general, fluctuates from safe to unsafe behavior.	Given a description of the physical and mental condition of a vehicle operator, predict the level of risk expected as a result of the operator's condition.
		Affective Generalize about responsible behavior involving low level risk acceptance.

Learning Activities	Evaluation
In this and the following episode, method is all important. The purpose is not to convey information but rather to help students discover why they behave as they do (motivation). Students should draw on personal experiences to answer questions posed by the teacher. The purpose of the questioning is to stimulate students to develop internal standards of responsible behavior. Discuss questions such as the following: (1) What major risks do vehicle operators take? (2) What risks did people like parents or friends take while driving last week? (3) What did the operator stand to gain by taking the risky action? (4) How did this compare with the gain? (5) Would a less risky alternative have been advantageous? (6) What about the potential loss in either the risky or less risky situation? (7) Does a vehicle operator always select the same alternative when confronted by the same situation? (8) If not, what causes him to decide differently? Give some examples. (9) What controls help the driver to select appropriate responses consistently?	*Cognitive* Describe two similar driving incidents involving one young person with the actions of the driver different in each case. Have the students theorize about the differences. Ask for different alternatives to the situations.
	Affective Does not accept more risk than he is prepared to handle adequately.

Resource Information

1.1 *Risk Acceptance*

a. Sometimes risks are taken to:

(1) save time;

(2) gain status;

(3) experience a thrill;

(4) satisfy the ego; and

(5) punish one's self and others.

b. Operator decisions typically balance a high probability of a small gain against a low probability of disastrous loss.

(1) To gain a few seconds, an operator will risk a dangerous passing maneuver.

(2) Because operators frequently make small gains from accepting traffic risks and suffer few losses in the way of collisions, a false sense of immunity develops.

(3) Little time is saved by speeding or taking other risks.

(4) Tendency to maximize the gain and minimize the probable failure exists.

(5) Risks are an inevitable part of living, but the irresponsible person takes unnecessary risks for little profit.

1.2 *Individual Differences*

a. An operator's personal-social needs and his values, not always compatible with safety, influence risk acceptance strongly.

b. Operators may have a greatly distorted concept of risk because of faulty analysis of the traffic scene (especially true with youths whose driving experience is limited).

c. Younger drivers are inclined to take more risks than older drivers.

d. Risk acceptance seems to be higher for men than for women.

1.3 *Group Influence*

a. Young people, especially, sometimes use an automobile to gain social acceptance. (Man needs to belong to a group and to be accepted by others.)

b. The individual tends to conform to the driving habits prevalent in the group he desires to join. One must guard against being swept up by a group and committing foolhardy acts with a vehicle.

c. Reckless conduct among some adolescent groups stems partially from their need to rebel against authority of parents and teachers.

d. Girls can influence the driving behavior of boys. (The reverse is also true.)

1.4 *Other Influences*

a. Although risk is inescapable in driving, the operator is usually able to determine the degree of risk he will accept.

b. Risk acceptance may be affected by hurry, emotional state, physical condition, passengers, trip purpose, alcohol, distraction, and other influences. These conditions should be identified and corrected for.

c. Reason tends to elude the hopelessly hurried and frustrated person making poor risks seem highly acceptable.

d. A person might accept unusual risk if he faces certain censure from coach, parent, or friend for being late.

e. Deliberate choices that look beyond the pleasure, thrill, or attraction of the moment and consider the possible consequences are more appropriate than impulsive choices.

Part IV Improvement Tasks
Unit A Self-improvement
Episode 2 Self-analysis and Improvement

EPISODE PRINCIPLE The operator's proficiency level approaches excellence through continuing self-evaluation and education.

EPISODE PURPOSE In this episode the learning activities involve students in searching for answers to questions. Asking students to draw on personal experiences and observations should encourage self-analysis in the future.*

*To manage effectively the question-discussion method suggested in this and other units, the teacher must step out of his customary role as the repository and conveyor of knowledge and become more like a counselor. He must listen and avoid preaching when he does talk. He should provide questions and other stimuli to provoke thought and to encourage self-analysis leading toward self-improvement. The resource information should give the teacher ideas for developing questions provoking thought and discussion.

Concepts	Supporting Principles	Behavioral Objectives
2.1 Self-Concept	Self-concept significantly influences behavior.	*Cognitive* Define the term *self-concept* and explain how self-concept influences behavior.
2.2 Young Drivers	Young drivers are most susceptible to accidents at the time they have the greatest potential to be skillful.	Given a list of traits that influence driving performance, identify those characterizing young drivers.
2.3 Assets and Liabilities	Attitudes, beliefs, and tendencies can either promote or interfere with effective living and driving.	Given a list of traits influencing driving performance, distinguish those that promote from those that interfere with competent performance on the highway.
2.4 The Driving Environment	The depersonalized driving environment may elicit less courtesy, tolerance, and friendliness from people.	Explain why highway behavior may be less personal than behavior in other social settings.
2.5 Vehicle Influence	Some young people become so absorbed in motor vehicles, they neglect school work and other responsibilities.	Predict the effect motor vehicles will have on an individual's life during the next five years.
2.6 Improvement Factors	Driver and traffic safety education can only help to establish a foundation upon which to build the characteristics needed for a successful driving career.	Indicate why some students following driver and traffic education continue to improve as highway users and others show little improvement.
2.7 Do-It-Yourself	Young people dissatisfied with the values controlling their behavior can change.	Develop a set of practical guidelines for self-analysis and self-improvement as a highway user.
2.8 Safety "for"	To realize a life of creative usefulness and personal fulfillment, a person must perceive safety as a positive and dynamic value interacting with other individual and social values.	Summarize personal beliefs (philosophy) about safety as a value.
		Affective Adopt a personal set of self-improvement guidelines as a highway user.

Learning Activities	Evaluation
1. Questions such as the following should help students analyze and clarify their values concerning driving behavior: (1) What assets and liabilities do young drivers have? (2) How can liabilities be minimized? (3) Why do young drivers have a disproportionately higher share of accidents for their numbers? (4) What acts triggered by the vehicle can be observed in others? (5) What is the effect on driving performance? (6) What does the vehicle do to or for the driver? (7) Does this influence help or hinder driving and school performance? (8) What rules might a parent set up for his child's use of the car? (9) What traits mark the expert driver? List personal main strengths and weaknesses as a driver. (10) What feelings or attitudes brought on by the vehicle should be discarded or changed? (11) Is it possible for a person to change either needs and feelings or their effect on his driving? How? 2. Have the students determine conscious ways to drive differently during the week, make the modifications, and then report how the changes affected experiences on the road.	Objectives for all supporting concepts except 2.7 imply the method which should be used to measure learner achievement. Concept 2.7 is in the affective learning domain. See below. *Affective* Has a realistic concept of his abilities and shows signs of continuous improvement in both classroom and laboratory instruction.

Resource Information

2.1 *Self-Concept*

a. When an operator understands himself, he is a better judge of what he can and cannot do behind the controls.

b. Self-knowledge also helps him understand the limitations and anticipate the actions of other highway users. (Their limitations may be different from his.)

c. If a driver sees himself as courteous, he will do courteous things and will probably be treated courteously by others (self-fulfilling prophecy).

2.2 *Young Drivers*

a. Many young drivers use the automobile to handle tensions, restrictions, and other frustrations associated with growing up.

b. Frequently they lack the experience and judgment to evaluate traffic situations accurately and decide the best course of action.

c. Driving proficiency of youth is more adversely affected by alcohol, passengers, and other distractions than that of experienced drivers.

d. Young drivers often attempt maneuvers that test the limits of their fast reflexes and manual dexterity.

e. Young people tend to discount their weaknesses and assume adult counselors are overcautious.

2.3 *Assets and Liabilities*

a. Positive forces leading to driving competence are:

(1) pride in competency and a desire to improve;

(2) tolerance and courtesy toward other highway users;

(3) respect for traffic laws and enforcement;

(4) patience and alertness; and

(5) readiness to accept bad behavior from others without malice.

b. Beliefs, attitudes, and tendencies that interfere with effective driving are:

(1) over-confidence;

(2) competitiveness;

(3) stereotyping other drivers;

(4) fatalism;

(5) feeling of immunity;

(6) making unreasonable assumptions about the actions of other highway users; and

(7) blame transfer.

c. Needs and values are reflected in overt behavior; thus behavior is an index of the self.

(1) Is the car in good condition?

(2) Is concentration easily interrupted by distractions?

(3) Are other operators' errors upsetting?

(4) Is speed appropriate to the traffic?

(5) Are the rules of the road obeyed?

(6) Do excessive and inappropriate use of the horn, noisy exhaust, excessive tire squeal, and blaring car radio characterize the vehicle's approach?

(7) Is the vehicle a convenient and pleasant means of going places or a toy for playing games?

(8) Are difficult and frustrating situations met with calmness or with nervous impatience?

(9) Is driving an alternative when conditions make the driver unfit for it?

(10) Is it easier to admit mistakes in traffic or to rationalize and blame others?

2.4 *The Driving Environment*

a. Specific attitudes toward driving are a projection of the operator's personality.

b. An operator becomes an extension of his vehicle and tends to view other operators as parts of their vehicles, creating the tendency to treat other drivers as things.

c. Vehicles provide avenues for expressing character, temperament, and self-concept.

d. Driving an automobile is one aspect of contemporary life that enables people to express hostility, discourtesy, and emotional conflict anonymously and without much fear of reprisal.

e. Despite their anonymity as drivers, responsible operators control their negative and destructive tendencies with self-discipline by choosing:

(1) tolerance over retaliation;

(2) patience over impulsiveness;

(3) self-preservation over thrill seeking;

(4) responsible behavior over irresponsibility;

(5) courtesy over rudeness; and

(6) poise over panic.

2.5 *Vehicle Influence*

a. Vehicle use by a high school student is related to academic standing.

b. Holding a job to support a vehicle can affect the student's attitude toward school. He may:

(1) lose interest in studies, athletics, and other activities;

(2) detach himself from much of the purpose and meaning of school life; or

(3) drop out of school.

c. The use of the family car is an issue requiring an intelligent and cooperative solution.

2.6 *Improvement Factors*

a. Knowing all there is to know about anything, particularly about driving, is not possible, but experience can increase knowledge.

b. Parents may be better drivers than their children, simply because they have more experience. Experience, however, does not necessarily develop competency. Certainly some older drivers are not capable of handling modern traffic conditions.

c. Young operators must develop judgment to accept the responsibilities of driving.

d. In striving for excellence in driving, a person competes only with himself. Satisfaction and rewards make the effort worthwhile.

e. Driving is a task worth doing well because of the number of hours that a person spends in driving and because of the potential danger involved.

f. Learning to control the vehicle is relatively easy, but learning self-control presents a real challenge.

g. A competent or an incompetent operator can have the same degree of knowledge and physical skill.

(1) A rather unskilled operator may still be permitted on the road if, on the basis of a strong feeling of responsibility, he adjusts his driving to his proficiency.

(2) But no driver with adequate or even exceptional skills should be permitted to drive if his proficiency is not accompanied by sufficiently developed social responsibility.

h. Competent driving is contingent upon sound personality, because the inter-personal reactions of the operator depend on his mental and emotional adjustment toward himself, other highway users, and authority. Driving behavior reflects the person one is.

2.7 *Do-It-Yourself*

a. Undesirable values acquired in childhood can be discarded or modified in adulthood with increased control of environment and decision-making.

b. If attitudes and feelings change, behavior will change.

c. Unfortunately, the task is not easy because attitudes remain until experience belies them, and even then they tend to resist change.

(1) A person tends to withdraw from situations, people, and experiences that threaten his attitudes.

(2) Attitudes closely related to one's self-concept and self-esteem are far less easily changed than others.

(3) Changing an attitude that may mean rejection by one's social group is difficult.

d. Nevertheless, if young people are serious about becoming expert drivers, they can devise and implement a plan for improving value structure and driving behavior. They should:

(1) examine personal value indicators and decide which are assets and which, liabilities;

(2) seek reliable information about beliefs upon which personal attitudes are based; and

(3) analyze personal needs served by antisocial acts and develop a substitute means of fulfillment. Social status can often be enhanced by cooperation, responsibility, self-control, and courtesy.

2.8 *Safety "for"*

a. Safety as a concern often competes with time, status, group pressures, personal shortcomings, loyalty, bravery, adventure, and other values.

b. A concept of safety points up the difference between experiences that are unproductive and those that enrich and make life worthwhile.

c. Safe driving increases the probability of living and, by extension, the probability of achieving goals (safety "for" as opposed to safety "from").

(1) Safe driving helps the driver reach a destination to accomplish a purpose. By continuing to reach these destinations, with a good driving record, the privilege of driving is maintained.

(2) Indirectly, the driving privilege helps to accomplish other objectives, such as making the band or the team, graduating from high school or college, achieving career aspirations, and marrying and having a family.

Part IV Improvement Tasks
Unit B System Improvement
Episode 1 Traffic Law Enforcement

EPISODE PRINCIPLE Traffic laws and ordinances are designed to create orderliness, convenience, and protection on the highways.

EPISODE PURPOSE Usually, a community has traffic law enforcement commensurate with the understanding, interest, and support of the citizens. Therefore, in this episode, emphasis is placed on the benefits individuals derive from traffic law enforcement and on the ways they can influence the quality of traffic laws, police, and traffic supervision and courts. The ultimate purpose is to help the student develop a mature sense of responsibility toward traffic law enforcement.

Concepts	Supporting Principles	Behavioral Objectives
1.1 Kinds of Traffic Laws	Traffic laws cover many subjects. (Most of these laws can be integrated into the curriculum as they apply.)	*Cognitive* Describe different kinds of traffic laws and their purposes.
1.2 Conformity	Various factors can or should influence the response of highway users to traffic laws.	Contrast reasons for obeying or disobeying traffic laws.
1.3 Quality Enforcement	Good traffic law enforcement depends upon the acceptance of responsibility by both officials and citizens.	Given a description of traffic laws and general enforcement measures in a community, identify their strengths and weaknesses.
1.4 Police Traffic Supervision	The function of the police in highway safety is, as in other phases of law enforcement, to protect life and property and to preserve order.	Describe the functions of traffic police and the effects functions have upon drivers.
1.5 Violator — Police Relationship	Thinking and acting as a responsible person when accosted or directed by a police officer helps officer, community, and individual.	Given a description, including dialogue, of a police officer stopping a motorist for a traffic violation, evaluate the behavior of both officer and violator and hypothesize about the motivation for the participants' behavior.
1.6 Courts	Courts give fair and impartial justice to those arrested for traffic violations, but a further objective is to encourage voluntary compliance to the law, thereby reducing violations.	Given a case description of a traffic violator appearing in court, analyze the situation and the behavior of the participants.
		Affective Support local and state traffic law enforcement agencies.

Learning Activities	Evaluation
1. As the episode progresses, discuss questions such as the following: (1) Why are traffic laws necessary? (2) What are the different kinds of traffic laws and their purposes? (3) Which laws should the student know? What future conditions will require further knowledge? (4) Why are traffic violations committed? (5) Why do highway users comply with the law? (6) How should or does one feel about obeying and disobeying traffic laws? (7) Given traffic situations where law violations were committed, tell what violations were committed. Why? (8) What were the potential consequences? (9) What alternate behavior might have been demonstrated? (10) What characteristics must traffic law enforcement include if observance is to be widespread? (11) How should individuals react to unreasonable traffic laws? (12) What are the duties of traffic police? (13) What equipment and training are necessary to perform these duties? (14) How does or should one feel about police using unmarked cars and radar to catch speeders? (15) Should police chase a driver who does not stop when told? (16) What changes occur from childhood through adulthood in attitudes toward police?	*Cognitive* All objectives should be evaluated by essay questions. Content of each question is dictated by the behavioral objective.
2. Ask a police officer to discuss his duties, experiences, and feelings. 3. Have a small group of students visit a court session and report their findings to the class. 4. As the episode progresses, have the students role play various situations. Some suggestions follow: (1) A police officer stopping a driver for a traffic violation. (2) A judge, violator, clerk, police officer, witnesses, and jury taking part in a traffic court session. (3) A violator at the Violations' Bureau complaining about a $5.00 ticket, with the class analyzing the attitude of the violator.	*Affective* Prepares articles on topic for school or local paper; visits a police station or court; obeys the traffic laws; shows respect for police officers.

Resource Information

1.1 *Kinds of Traffic Laws*

a. Certificate of title and registration of vehicle laws are necessary to establish proof of ownership; protect a person from purchasing a stolen vehicle; aid enforcement officials in recovering stolen vehicles; and help the police to locate an individual in an emergency.

b. Antitheft laws help prevent unauthorized use of a vehicle, damaging or tampering with a vehicle, and other unwarranted acts.

c. Financial responsibility laws help protect the public from the uninsured motorist.

d. Civil liability laws govern the civil rights of one party to collect damages from another party in the event of a collision.

e. Accident laws and accident reports specify the responsibilities of persons involved in order to minimize the consequences and to furnish data for proper settlement.

f. Vehicle equipment and inspection laws aim to prevent drivers from operating an unsafe vehicle on public highways.

g. Laws dealing with highway administration are designed to create efficiency within and between various agencies and departments (federal, state, and local) responsible for the highway transportational system.

h. Size, weight, and load laws minimize delay, danger, and damage created by unreasonable size, weight, and load of vehicles.

i. To protect the public from unscrupulous practices, laws govern dealers, wreckers, rebuilders, and owners of rental vehicles.

j. Driver licensing laws help to insure that only physically and mentally qualified people may drive and to prevent unjustified denial of the privilege to drive.

(1) Driver licensing laws furnish a social device by controlling and sometimes suspending or revoking the license of a driver unwilling to respect the rights of others.

(2) Driver licensing laws should provide for a driver improvement program based on a point system, assigning weight to different violations with a plan to help problem drivers or restrict those who do not improve.

(3) Some of the most serious and willful violations carry mandatory revocation or jail sentence, for example: driving under the influence of alcohol or drugs; driving while under suspension or revocation; or leaving the scene of an accident.

k. Rules of the road establish specifications for conventional behavior to help highway users make predictions.

(1) These rules of social conduct cover obedience to and effect of traffic laws; traffic signs, signals, and markings; overtaking and passing; rights-of-way; pedestrians' rights-of-way and duties; starting, stopping, and turning; speed restrictions; serious traffic offenses; stopping, standing, and parking; operation of motorcycles, bicycles, and play vehicles; and miscellaneous rules.

(2) Rules of the road represent arbitrary standards of conduct that do not provide for individual differences.

(3) As a practical matter since laws governing behavior are general, the highway user's best judgment is required to apply them intelligently to the reality of traffic situations ("reasonable and prudent;" "so close thereto as to constitute an immediate hazard;" "within the assured clear distance").

(4) Uniformity reduces misinterpretation, confusion, and delays.

1.2 *Conformity*

a. Traffic violations are committed because operators and pedestrians are:

(1) ignorant of the law or its details;

(2) preoccupied or distracted and inadvertently fail to comply;

(3) physically or mentally deficient or affected; or

(4) intentionally disobedient.

b. Highways users comply with the law because of:

(1) knowledge and approval;

(2) concurrent standards of conduct and action;

(3) sheer respect regardless of personal wishes;

(4) pride in a clean record;

(5) fear of inconvenience or of embarrassing punishment;

(6) desire to set a good example (parent or driver education teacher); and

(7) common sense.

c. Most operators are aware of formal laws and restrictions, but the sense of anonymity and the nature of the traffic environment tend to obscure personal ethics and diminish respect for others' rights.

(1) The motorist driving 40 mph in a 30 mph zone when the street is clear is violating a law but endangering no one.

(2) The motorist driving 30 mph in the same zone when the street is congested, however, is endangering others. He is certainly not heeding the basic speed law obliging him to drive carefully. (p.20; DLM)

d. Conformance to traffic laws, in addition to decreasing the chances of an accident, fine, jail sentence, loss of driving privilege, or criticism and embarrassment, can produce:

(1) peace of mind;

(2) increased self-esteem;

(3) parental approval leading to more driving privileges;

(4) pride in a clean record;

(5) social approval and a better image for young drivers;

(6) more enjoyment of driving when fear of apprehension is removed; and

(7) increased probability of reaching a destination in time without incident.

e. Major traffic crimes (homicide, neglect of duty following an accident, trying to outrun the police, illegal possession of alcoholic beverages, drinking and then driving, drag racing, reckless driving, "borrowing" a car without permission, and others) can have serious and permanent consequences for the offender.

(1) The privilege of retaining a driver's license is dependent on highway behavior.

(2) Chances for employment and the opportunity to become prominent in business, industry, and government would be markedly reduced.

(3) The guilt of a highway homicide caused by negligence would be a heavy burden.

f. That adults act immorally, stupidly, unsafely, and even viciously does not excuse similar behavior in young people.

1.3 *Quality Enforcement*

a. Each individual's job is to evaluate and support good law enforcement in his community and elsewhere.

b. The deterrent aspect of traffic law enforcement is effective to the degree highway users:

(1) understand the laws;

(2) believe in the reasonableness of the laws; (Unreasonable laws are an obstacle to traffic movement and breed disrespect.)

(3) believe in the likelihood of being detected and apprehended if they violate; and

(4) believe in the certainty and adequacy of the penalty.

c. Since the eye of enforcement is upon the individual for only a small percentage of driving time, his own conscience is the most practical policeman. This means accepting and adopting certain disciplines and practices.

d. The responsible person obeys unreasonable as well as reasonable traffic laws but works through appropriate channels to revise the unreasonable.

1.4 *Police Traffic Supervision*

a. Traffic police supervise traffic by:

(1) enforcing traffic laws; (To protect the highway user from his own unlawful behavior and that of others, the police officer is bound to detect, apprehend, and aid in prosecuting traffic violators.)

(2) investigating traffic accidents; and

(3) directing and controlling traffic at busy intersections, sports events, and special occasions. (In emergency situations, police officers expedite the movement of traffic by personally directing drivers and pedestrians.)

b. In addition, they provide services to facilitate the safe and efficient movement of traffic.

(1) A portion of the traffic officer's time is spent in servicing and assisting the motorist who has a flat tire, empty gasoline tank, spilled load, or other troubles. These conditions interfere with traffic flow and often jeopardize the affected motorist and other highway users.

(2) In addition to protecting the highway user, the police officer is responsible for protecting the highway from damage, misuse, and litter.

(3) As voluntary compliance with the legal requirements of driving increases, the need for police traffic supervision decreases. So police officers

encourage compliance by informing highway users of laws, hazards, and consequences of illegal acts (via press, radio, television, schools).

c. Police traffic supervision, reflected in the preceding functions, requires an adequate number of carefully selected, highly trained men with vehicles and modern scientific devices.

1.5 *Violator-Police Relationship*

a. Running from the police is stupid and dangerous, because once the chase starts the officer's duty is to follow. A chase can result in the senseless loss of life and property of innocent bystanders.

b. If ordered to pull over, the driver should:

(1) do so immediately;

(2) in disagreeing with the charges, state the case clearly and courteously without arguing; and

(3) present driver's license and sign the citation if requested. (This does not admit guilt.)

c. A police officer is authorized to investigate a car parked in a secluded spot since:

(1) carbon monoxide could be present;

(2) a robbery may have been committed in the area;

(3) a car could have been stolen;

(4) a person may have been reported missing;

(5) an escapee from an institution or jail may be in the area. (Attacks by criminals on young people in parked cars appear to be increasing.)

d. A police officer is identifiable (uniform, marked car, badge, gun), but often an individual's function is not obvious.

e. Reasonable allowances must be made for normal errors of judgment, impatience, and anger on the part of police.

(1) The job involves many frustrations and problems.

(2) An occasional policeman is bad, but to condemn an entire department for an individual's behavior is unfortunate.

(3) To repeat critical stories about police or anyone based on hearsay, is not justifiable because of the possibility of distortion or falsification.

f. No one need fear police action if he has not committed a violation.

1.6 *Courts*

a. Unfortunately many people think a judge's only function is to punish, but, by explaining the logic of traffic laws and the necessity for compliance, he is also able to improve drivers.

b. Court judges are in a unique position to educate and correct the behavior of violators.

(1) At the beginning of the court session many judges inform alleged violators about the causes and preventives of traffic accidents with particular emphasis on individual responsibility.

(2) The competent judge also helps the alleged violator to see unsafe and unintelligent aspects of his violation, so he is more likely to conform to traffic laws in the future.

(3) When the court feels a violator might benefit from formal educational experience, he may be assigned to a driver improvement (traffic violator) school as total or partial penalty for the violation.

c. Experience in court can influence the individual's respect for laws governing his conduct on the highway and for the judicial system in general.

(1) Of all the people tried in court, an estimated 95 percent appear for traffic offenses. In most instances, impressions of this experience are their only firsthand knowledge of our judicial system.

(2) The driver who leaves the court satisfied with the way his case was handled is less likely to return.

(3) Without effective working support of the courts, police-enforcement processes tend to become lax or arbitrary, creating disrespect in the public. (Uniform interpretation, adequate penalties, and elimination of overloaded court dockets, "fixing," and favoritism are needed.)

d. When the court is effective, when penalties are certain, swift, impartial, and adequate, the community benefits.

(1) Judges need the backing of leaders and public assurance that citizens want impartial handling of traffic cases.

(2) The American Bar Association recommends a program entitled "Go To Court As a Visitor Not a Violator." This program is designed to stimulate citizens to work with the judge toward improving the court.

e. A person cited for a traffic violation and requested to appear in court responds more intelligently if he understands the legal process.

(1) Usually the defendant receives a summons or a ticket, indicating where and when to appear.

(2) Sometimes the case can be dealt with by mail or by appearing at the Violations Bureau.

(3) If the case is handled in court, the violator (defendant) is told his rights and the charges and is asked to plead "guilty" or "not guilty."

(4) Pleading "guilty" usually results in a fine, imprisonment, or adjournment to attend a driver improvement school. It is unwise to plead guilty because it seems the easiest alternative.

(5) If the defendant pleads "not guilty," the judge schedules the trial, possibly immediately.

(6) The defendant may have his case postponed to prepare his defense and to obtain a lawyer, but the request must be made when he is first called to the bench.

(7) To prepare for trial, one should analyze the statute or ordinance governing the charge, interview and require defense witnesses to attend the trial, and organize a defense logically.

(8) At the trial, before a judge alone or with a jury, the defendant has the right to cross-examine witnesses and the opportunity to present his side of the case after the prosecution has presented evidence. He should be brief without arguing with witnesses or the prosecution.

(9) After both sides have presented their cases, the judge or the jury decides guilt or innocence.

(1) The defendant has the right to appeal any decision he feels wrong or unjust.

Part IV Improvement Tasks
Unit B System Improvement
Episode 2 Traffic Engineering

EPISODE PRINCIPLE Traffic engineering directly and persistently affects the highway users' (driver and pedestrian) tasks.

EPISODE PURPOSE This episode is designed to help the beginning driver understand the traffic engineering function and the problems of the traffic engineer.

Concepts	Supporting Principles	Behavioral Objectives
		Cognitive
2.1 Traffic Engineering Function	Traffic engineering — a specialized branch of engineering — deals with the planning, geometric design, and operation of streets and highways to allow safe, convenient, and economical transportation of persons and goods.	Define the term *traffic engineering* and list the functions performed by traffic engineers.
2.2 Development of Traffic Engineering	Traffic engineering as a professional specialty is new, but the concept of regulating traffic movement or operation predates the introduction of the motor vehicle.	Identify the key events in the history and development of traffic engineering.
2.3 Turbulence	Turbulence in traffic (stops, starts, changes of speed and direction) reduces street capacity and is one of the most important single causes of vehicle - vehicle accidents.	Identify the elements causing turbulence in traffic movement.
2.4 Uniformity	National uniformity of signs, signals, and markings is essential to reduce confusion and to increase voluntary obedience in motorists	Describe traffic situations where lack of uniformity in sign, signal, or road markings could cause driver confusion.
2.5 Warrants	Stop signs, yield signs, and traffic signals assign right-of-way, reduce severity and certain types of accidents, and improve traffic efficiency; but unjustified, poorly designed, or improperly operated signs and signals can impede traffic movement, increase accidents, and breed disrespect for traffic control devices.	Identify traffic engineers' considerations in determining proper speed limits and installing signs and signals.
2.6 Tools	Various tools are used by traffic engineers for studying and evaluating high accident locations.	Given spot and flow maps, collision diagrams, and other tools of traffic engineers, interpret them by answering a series of questions correctly.
2.7 Techniques	Fortunately, no community has to accept traffic chaos and its penalties (reduced retail sales, lower property values, slowed down community development), because specialists are available to apply traffic engineering techniques to remedy them.	Given rural and urban highway scenes, suggest ways to improve traffic flow and safety with relatively inexpensive techniques.
2.8 Public and Individual Rights	In locating new highways, both individual and public rights must be protected.	Summarize the problems of locating a new highway and how government attempts to ease them.
2.9 Pressures on Traffic Engineers	A traffic engineering department must be adequately staffed, assigned primary responsibility for traffic control, and backed up with sufficient authority to make decisions hold.	Identify the problems traffic engineers face in implementing sound ideas and in rejecting unsound suggestions from various sources.
		Affective Consider the possibility of pursuing a career in traffic engineering.

Learning Activities

1. The teacher or traffic engineer leads a discussion on a reading assignment.
2. Have the students cite examples from the community to illustrate the traffic engineer's handiwork.
3. Ask several students to observe traffic movement at a peak period and identify impediments to traffic flow.
4. Students present examples of lack of uniformity in signs, signals, and markings they have observed and how highway users were or could have been affected.
5. Students can learn about warrants through a reading assignment and then observe local situations to determine if recommended warrants were applied.
6. Students analyze spot and flow maps, collision and condition diagrams, speed charts, and before and after accident records. Then student committees, working closely with the local traffic engineer, can conduct intersection studies and prepare a report including condition and collision diagrams and flow map diagrams, written explanation of their findings, and proposed recommendations.
7. Students evaluate various measures traffic engineers use to improve driving conditions such as one-way streets, turning lanes, parking restrictions, pavement markings, and removal of hazards near the road.
8. The teacher presents a tape recording of an open hearing on the location of a new highway.
9. Have the students conduct a taped or classroom interview with a traffic engineer to ascertain obstacles interfering with achieving his objectives. This interview can also include a discussion of the episode's supporting concepts.

Evaluation

Cognitive

Most of the lower level learning can be measured by multiple choice and true-false questions.

Describe a problem in a highway traffic system created by a traffic engineer. The student analyzes the problem, using the supporting concepts.

Affective

Consults a traffic engineer, teacher, or counselor about career opportunities in traffic engineering.

Resource Information

2.1 *Traffic Engineering Function*

a. Traffic engineering operates on the principle that official responsibility does not end with building and maintaining roads but includes efficient operation of those facilities.

b. The traffic engineer is involved in redeveloping entire street systems, in designing specific roads, and in using traffic control devices to assure the best use of roads, new or old. (The best remedy is the one correcting the situation with the least interference at the least cost.)

c. When funds are not available for correcting hazards by reconstruction, the traffic engineer must rely upon traffic control devices to warn motorists.

d. The quality of future highway transportational systems greatly depends on the studies and planning of today. The traffic engineer is part of a team of specialists considering:

(1) present and future uses of land;

(2) present and future traffic patterns (based on existing and projected land usage);

(3) limitations in the existing transportational system;

(4) predictions of future development in vehicle design and capability; and

(5) driver characteristics and limitations.

2.2 *Development of Traffic Engineering*

a. Caesar forbade vehicles in the central districts of Rome and decreed one-way streets and parking regulations for chariots.

b. The building of highway facilities apparently was well developed, and some of the old Roman military roads can be seen today.

c. The first professional traffic engineer appeared in this country about 1922.

d. Not until the 1930s did the science and art of traffic engineering develop and only in recent decades has its importance and technology been understood and accepted.

2.3 *Turbulence*

a. The flow of traffic in a network of streets can be compared to that of the blood stream in the body. Any blockage or irregularity affects the smooth flow throughout the system.

b. Unnecessary traffic signals, signs, parking, and other conditions disturbing the smooth flow of traffic should be eliminated.

c. Differences in speed cause vehicle-to-vehicle friction, justifying minimum and maximum limits.

2.4 *Uniformity*

a. Traffic signs should be uniform in application, shape, color, and message and reasonably uniform in size and location.

b. Pavement markings like those designating no passing zones, must be uniform in color and application.

c. Poorly maintained signs and markings are often unintelligible and encourage disobedience.

2.5 *Warrants*

a. Judicious speed zoning assists operators to conform voluntarily to speeds for different physical and traffic conditions.

(1) The 85th percentile serves as a criterion for determining speed limits (a speed under which 85 percent of the vehicles travel).

(2) Studies have shown traffic speeds are not much affected by posted speed limits, possibly because many posted speed limits are unreasonably low.

b. Traffic engineers have devised warrants to guide in installing traffic lights.

(1) Warrants consider the volume of vehicle and pedestrian traffic and the ratio of traffic between the intersecting streets.

(2) Traffic signals are mixed blessings where safety is concerned, because they ordinarily reduce right-angle collisions and increase rear end collisions.

c. Stop signs should be used as required by physical and traffic conditions.

d. Yield signs assign right-of-way at low volume intersections where visibility is good.

2.6 *Tools*

a. Spot maps show concentrations of accidents warranting detailed analysis.

b. Collision diagrams show approximate paths and movement patterns of vehicles and pedestrians involved in collisions.

c. Condition diagrams reproduce to scale the important physical conditions at a location.

d. Flow maps indicate the volume and direction of traffic.

e. Speed charts show the speed of vehicles approaching the hazardous location.

f. Before and after accident records furnish a means for evaluating the effectiveness of changes made.

g. Electronic data processing analyzes accident data and links data with highway, vehicle, and driver information by means of computers.

2.7 *Techniques*

a. A major concern of the urban traffic engineer is developing a system of principal traffic streets. Given adequate resources and support, he can accomplish this by:

(1) traffic signal systems coordinated to provide a smooth flow of traffic under changing volume conditions;

(2) separate traffic lanes for loading, unloading, or transferring passengers at transit stops;

(3) additional traffic lanes or approaches to signalized intersections;

(4) channelization of traffic;

(5) one-way streets;

(6) prohibition of turning where the capacity of an intersection must be increased or installing special turn intervals;

(7) pedestrian and highway grade separations to relieve bottlenecks at complex intersections; and

(8) prohibition of curb parking.

b. Rural roads need to be modernized to handle the volume and speed of modern traffic. Many improvements are relatively inexpensive and can be done by state and county engineers supported by citizens.

(1) Cleaning out shrubbery, removing or relocating signs, etc., provides greater visibility at intersections, at sharp curves, and at railroad grade crossings.

(2) Eliminating steep side slopes and deep ditches and replacing obsolete guard rails decreases the severity of some accidents.

(3) Correcting road surfaces that have high crowns or tend to be slippery when wet helps drivers maintain control of their vehicles.

(4) Removing physical obstructions (mailboxes, trees, poles, signs) close to the road eliminates a fixed-object hazard and also increases sight distance.

(5) Substituting modern directional signs for undersized, nonstandard, low signs improves sight distance.

(6) Laying out passing and no passing center lines accurately aids the driver.

(7) Providing sufficiently wide lanes for modern traffic helps to prevent head-on, side-swipe, and run-off-road accidents.

(8) Using reflective paint on danger points like bridge abutments helps reduce accidents.

(9) Replacing rigid sign supports that injure motorists on impact with breakaway posts helps to reduce the severity of injuries.

(10) Oversized warning signs sometimes reduce the hazard at high accident locations.

(11) Safety could be improved if dangerous portions of rural highways were properly lighted (curves, intersections, bridges, overpasses, underpasses, tunnels, interchanges, elevated and depressed areas, etc.).

(12) Speed signs, based on actual study of conditions and located below curve signs, help the motorist.

(13) Eliminating or reducing excessive curves, increasing visibility at hillcrests, and providing frequent passing sections are costly but necessary if rural roads are to be improved.

c. The freeway design required on the interstate system demonstrates many types of accidents can be reduced or eliminated by: fully controlled access; wide median strips; grade separations; acceleration and deceleration lanes; adequate sight distances; wide shoulders; unobstructed roadsides; flat drainage slopes; and absence of traffic lights, parked cars, pedestrians, and slow traffic.

(1) In addition, the freeway design acknowledges a driver can assimilate only limited information and must have sufficient time to act on it. (Destination points on one sign should be limited to three, and the sign should be placed one-quarter to two miles before the exit.)

(2) The traffic engineer cannot protect the driver completely from rear-end and run-off-road collisions.

2.8 *Public and Individual Rights*

a. Before the location for a new highway is finally decided upon, public hearings give people the opportunity to hear the facts and to voice objections.

b. Those people who must move suffer inconvenience and sometimes hardship, but highways serve all the people. (Every effort should be made to reduce the inconvenience and eliminate the hardship.)

c. New and improved highways increase overall business.

2.9 *Pressures on Traffic Engineers*

a. Traffic engineers experience pressures from individuals and groups motivated by selfish interests.

b. Traffic engineers are targets for criticism and advice from well meaning but often badly informed "traffic experts."

Part IV Improvement Tasks

Unit B System Improvement

Episode 3 Suggestions, Guidelines, and Resources for Action

EPISODE PRINCIPLE Private citizens can influence the development and management of the highway transportation system.

EPISODE PURPOSE This episode follows from Part I, Episode 1 where it was suggested some teachers might involve students in a term project designed to improve some element in the system. The principles and procedures presented here can serve as guidelines for such a project as well as motivate and prepare students for subsequent involvement.

Concepts	Supporting Principles	Behavioral Objectives
3.1 Suggestions and Guidelines	Responsibility for the highway transportation system extends beyond duties as vehicle operators; it includes non-operating activity that contributes to overall system efficiency and improvement.	*Cognitive* Given a list of specific deficiencies in highway traffic system components and procedures for a private citizen to initiate or support corrective action, select the most appropriate procedure.
3.2 Developmental and Management Forces — Component Classification	Many forces work to improve highway facilities, traffic movement, vehicle performance, and highway-user performance.	Classify the various governmental, business, industrial, and educational forces involved in developing and improving the major components (man-machine-road) of the highway transportation system. *Affective* Try to improve the local highway traffic system.

Learning Activities	Evaluation
1. As suggested in Part I, Episode 1, the learning activity described below should be started early in the course following these steps: (1) The teacher presents guidelines for the project. (2) The students are requested to identify deficiencies in highway traffic conditions in their community and to suggest tentative solutions. These solutions are then evaluated by other students, the teacher, and possibly resource people like police or engineers. (3) The students, individually or as a committee, select a term project that promises to improve some element of the traffic program in their community or state. Closely supervised by the teacher and with full knowledge of public officials responsible for the selected part of the system, the students proceed to design the project; gather data; interpret the findings; and prepare a report for the class or possibly a wider audience.	*Cognitive* Gives real deficiencies in highway traffic system components and suggests possible corrective action a citizen could initiate. Gives a list of agencies that can improve the highway transportation system and indicates the system component each can improve.
2. Charts and written explanations of the many forces directly concerned with the highway transportational system will provide students with knowledge needed in the learning activity in 3.1 and will allow them to use the system, as operator or non-operator, more effectively in the future.	*Affective* Chooses a project that can realistically improve the situation; seeks various means for effecting such improvement.

Resource Information

3.1 *Suggestions and Guidelines*

a. Regardless of occupation or status in a democratic society, concerned citizens can voice opinions and suggestions about public problems.

(1) An individual can help stop rumors, myths, and misdirected actions by uninformed citizens with good intentions who think they have a solution to some phase of the traffic problem.

(2) Citizens can also seek out information on the needs, problems, and plans of local and state traffic officials and help them gain support for sound programs by: exercising their voting privilege; directly influencing individuals and groups with whom they associate; working with traffic safety councils and other citizen support organizations; or making personal appearances before a county board of supervisors or a state legislator to explore solutions.

(3) Before voting for or against public officials, a citizen should consider their interest in improving the highway transportation system.

(4) Complaints, compliments, and suggestions on state administered programs (vehicle inspection, driver licensing, etc.) can be sent directly to the responsible state official or legislator.

(5) Citizens should inform themselves about proposed state and federal legislation on highway transportation and help legislators make wise decisions about traffic legislation by expressing their views. Legislators report they hear rarely from their constituents on traffic safety matters.

(6) An individual or an organization can communicate ideas and suggestions concerning federal standards on traffic safety to the National Highway Safety Bureau or a congressman.

(7) Citizens can communicate complaints, suggestions for improvement, and compliments regarding the vehicle to the dealer, manufacturer, or National Highway Safety Bureau.

b. Before attempting to improve the highway transportational system, the individual should seek reliable information concerning his legal and moral responsibilities to the agencies and programs involved. (See 3.2 for list.)

(1) The more closely one is involved with a public question, the more personal it becomes.

(2) Facts as well as good intentions are needed to solve problems; otherwise; citizens may interfere with progress.

(3) The problem of traffic safety is too large to solve with one plan, but progress can be made. Safer intersections, more orderly traffic and parking near schools, better traffic courts, qualified driver education teachers, first-aid training for ambulance drivers all contribute to the system's efficiency.

(4) Highway safety officials working on a public problem are obligated to balance the needs and desires of special interest groups with those of the general public and to make the best decision.

(5) Resources are limited, so decisions about spending public funds to improve highway systems must be made, considering demands for other programs.

c. Sometimes an individual operating alone can stimulate action quickly and effectively, but more often the individual must enlist the support of other individuals and groups.

(1) The good traffic citizen responds to and operates with others to obtain a better system.

(2) Working with others toward a common goal is stimulating.

(3) Interested individuals and groups could be classmates or colleagues, driver education and other teachers, youth or service club members, junior chamber of commerce members, mass media, local traffic safety organizations, public officials, and legislators.

d. High school students can contribute time and talent to improving the highway transportation system by:

(1) suggesting that qualified traffic officials speak to interested organizations;

(2) expressing views about traffic safety to schools or community in letters to the editors of newspapers and magazines or to radio and television stations;

(3) helping driver education teachers to select the best content and methods; and

(4) reporting hazardous highway and traffic conditions in the community to the proper authorities. (Bad chuckholes, obstacles to vision, confusing signs or markings, and other conditions obviously impede safe and expeditious movement of traffic.)

e. An adult's potential contribution to an improved highway transportational system can depend on his career. The good citizen in a democratic society makes unique contributions through his special talents and abilities.

(1) A physician is in a good position to advise patients about the relationship of physical and mental health to driving behavior and precautions to take if they are ill, handicapped, or using prescribed drugs.

(2) A teacher has an opportunity to influence the student's knowledge and values concerning the highway system and driving behavior.

(3) An athlete or an entertainer has an opportunity to influence the traffic behavior of those who respect his talent.

(4) A legislator, a county commissioner, or a city councilman is in a particularly strong position to lead in highway traffic safety.

(5) Those engaged in mass communications (press, radio, TV) can impart traffic safety information to large numbers of people.

(6) Many career opportunities are open to those who choose highway safety management (researchers, professionals, administrators, supervisors, specialists, technicians, or drivers).

(7) A parent has opportunities to contribute to traffic safety by: setting a good example as a driver; modeling healthy attitudes toward traffic officials; and developing individual and social responsibility in his child.

f. Participating in programs to improve society via traffic safety can help one to:

(1) identify with others;

(2) gain status and recognition from peers;

(3) acquire self-esteem;

(4) demonstrate maturity; and

(5) have the satisfaction of assisting to solve a public problem.

3.2 *Developmental and Management Forces — Component Classification*

a. Constructing and maintaining highway facilities and controlling traffic on those facilities are huge tasks involving many resources.

(1) The United States Department of Transportation, through its Bureau of Public Roads, administers the federal-aid highway program and, in cooperation with state highway officials, establishes standards for highway design, construction, and maintenance.

(2) State, county, and municipal road departments control the building and maintenance of other roads.

(3) The United States Congress, state legislatures, and local governmental bodies appropriate the funds for building and maintaining roads mostly from taxes on gasoline and oil, vehicle license fees, and excise taxes on tires.

(4) Federal, state, and a few local governments employ traffic engineers responsible together with the police and highway patrols for the safe, convenient, and rapid movement of highway traffic.

(5) Private engineering consulting firms on a contract basis have a prominent part in planning, design, and operation of highway systems.

(6) Universities conduct research on highway construction and traffic movement and also educate highway safety and engineering personnel.

(7) Junior colleges include pre-service and in-service educational programs for traffic engineering technicians, police, and others. Far too little training and education of highway safety personnel in any educational institution is done, however.

(8) Industry and business through foundations, boards, and institutes support research and educational activities designed to improve highway facilities and traffic flow.

(9) Road building is big business, heavily involving concrete and asphalt companies, sign and signal manufacturers, and other segments of the business and industrial world.

(10) Numerous official and non-official safety organizations influence highway facilities through the legislative process, public support, and other means.

b. The design and operating condition of vehicles used on highways depend on various factors.

(1) In large measure, the automotive and allied industries determine the design, operating characteristics, and reliability of a vehicle.

(2) The National Highway Safety Bureau specifies standards for new and used vehicles to: simplify the driving task; make vehicles sturdier; improve vehicle operating characteristics; and give additional protection to passengers.

(3) Each state has a motor vehicle registration

system that furnishes rapid identification of each vehicle and owner, and most protect the title and ownership of the owner.

(4) State statutes specify minimum safety equipment standards for motor vehicles.

(5) State and local vehicle inspection programs are designed to check and correct defective components.

(6) Commercial organizations and governmental agencies operating large numbers of vehicles have carefully planned maintenance programs.

(7) Universities, through grants from industry and the federal government, augment research carried on by the automotive and parts industry to improve the safety and efficiency of automobiles.

(8) Junior colleges, technical schools, and the automobile industry train auto mechanics, but a serious shortage still exists.

(9) Automobile agencies, selling new and used cars and providing maintenance service to owners, influence the quality of vehicles on highways.

(10) The quality of maintenance work done by independent garages is vital to vehicle performance and safety.

c. Many agencies and institutions strive to influence the behavior of highway users.

(1) The National Highway Safety Bureau sets state standards for such things as driver education, driver licensing codes and laws, police traffic services, traffic courts, and motorcycle safety.

(2) Professional associations establish policies, develop materials, and provide other services to stimulate and improve highway users' behavior.

(3) State departments (motor vehicle and education) are responsible for administering laws related to the licensing, improvement, and education of drivers and school bus transportation.

(4) Elementary and secondary school curricula are designed to improve the behavior of all highway users.

(5) Colleges and universities prepare professionals (police, judges, engineers, driver education teachers) and conduct research on driver behavior and on teaching methods.

(6) Traffic laws are established by state legislatures and ordinances are established by city councils to influence and control behavior.

(7) State police, highway patrol, city police, and sheriffs deter illegal and unsafe behavior on the highways.

(8) Many different courts at various levels of government determine guilt or innocence and impose penalties on traffic violators.

(9) Industry and business support foundations, institutes, and councils that conduct activities to improve the behavior of highway users.

(10) Mass media use their resources to influence the behavior of drivers and pedestrians.

(11) The armed forces, commercial organizations, and others employing many drivers conduct training programs, sometimes engaging outside consultants.

APPENDIX

LESSON PLANS

Information Concerning the Sample Plan

Lesson Topic More than one lesson (classroom and laboratory) may be required to accomplish the objectives of the episode. Lessons are structured around context and method concerning a particular task like turning, passing, or parking. Usually a lesson will take one or two periods.

Intermediate and Terminal Objectives The terminal objective is the behavior expected of the student at the end of the lesson or course. It encompasses the intermediate objectives accomplished in the sample lesson through suggested learning activities.

When the number of objectives equals the number of supporting concepts and no terminal objective is stated for a classroom lesson, the teacher can:

1. formulate a terminal objective that includes the intermediate objectives; or
2. develop more than one lesson with one of the intermediate objectives as a terminal objective for each.

In any case, when developing a terminal objective the teacher must be reasonably certain that:

1. the behavior contributes significantly to course objectives;
2. the degree to which students have achieved the objective can be measured; and
3. learning activities equivalent or analogous to the testing situations are provided.

Learning Activities The learning activities are only suggestive. Their selection should take into account:

1. students' capabilities and special interests;
2. teachers' creativity, resourcefulness, and capabilities; and
3. available resources and conditions.

Sample Lesson Plan

Part II On-Highway Tasks
Unit B Interacting With Highway Environment
Episode I Movement Within Traffic Flow

Lesson Topic Following and Being Followed

Terminal Objectives

Cognitive: In a series of traffic situations involving fore and aft relationships, identify cues and select ways the operator can reduce the probability of conflict with other highway users.

Affective: Follow sound practices in interacting with vehicles fore and aft.

Learning Activities

1. Direct the students to write answers to the following questions in a class period:
   a. Why should the driver increase following distance as speed increases since the braking distance of the vehicle in front increases in proportion to his?
   b. What conditions require a following distance exceeding the usual in order to maintain the same degree of safety?
   c. In what way is driving more difficult for the tailgater? What advantages does a driver enjoy when he maintains a reasonable following distance?
   d. What clues ahead indicate to the operator that the driver in front may have to slow down or stop?
   e. What measures under the driver's control can reduce the probability of conflict with the vehicle following?
2. Spend approximately 15-20 minutes discussing student responses to the questions in Step 1. Supplement their answers as necessary.
3. Expose students to a series of traffic scenes (moving pictures, slides, still pictures, or diagrams) showing fore and aft relationships of vehicles. Direct them to identify potential hazards and corrective measures that facilitate safety and traffic flow.
4. Use this technique to evaluate the outcomes of the cognitive objective.
5. In the laboratory phase, the student drives in heavy traffic at speeds between 20-30 mph. If a multiple-car facility is utilized, proper following distance should be stressed throughout the course.
6. Evaluating the affective objective should be accomplished during the next lesson while another objective is pursued. The student should be unaware of the affective objectives of any lesson to make their evaluation valid.

Letter to Parent or Guardian at Beginning of Driver and Safety Education Course

Dear ______________________:

We are pleased to have your son (daughter) enrolled in the driver training course. This course consists of ______________ periods of actual practice driving behind the wheel and ______________ periods of observation in the car.

The car (cars) used for practice driving is (are) insured and is (are) equipped with dual controls and seat belts in order to provide maximum safety.

It is our desire to help students to be safe motorists and intelligent pedestrians. In the limited time at our disposal, we will be able to introduce your son (daughter) to the basic knowledge and techniques necessary to operate a motor vehicle safely and skillfully.

We will inform you of progress made during the semester. Please do not hesitate to contact us if you have a question.

Very truly yours,

____
Principal

____
Instructor

Driver Training Evaluation Record Card

____
(Last name) (First name)

Age__________ Birthdate_______________________
(Month) (Day) (Year)

Male Female

Instructor______________________________

Period_______________Class_______________

Final grade in course______________________

Student license number_____________________

Date training completed_____________________

Date completion card issued___________________

Type of transmission:

Manual ☐ Automatic ☐

Items to be evaluated	Excellent	Good	Fair	Poor	Not acceptable
Clutch-gas coordination					
Steering					
Braking					
Shifting					
Ability to appraise traffic conditions					
Confidence					
Emotional stability					
Attitude					
Potential driving ability					

Remarks:

Driver Instruction Summary Card

Period

Section

Group

Semester Year

Name (First) (Middle) (Last) Sex Grade level

Address (Number) (Street) (City) (Code)

Telephone no.

Parent or guardian

Address Telephone no.

License number(s) (Student) (Permit) (Regular)

Driver education	Driver training
Dates of instruction	Dates of instruction
to	to
to	Instructor
Instructor	Hours BTW
Final grade	OBS
Total hours	Total

Comments:

(Instructor's signature)

Letter to Parent or Guardian at Conclusion of Driver Training Course

Dear ______________________________:

Your son (daughter) has satisfactorily completed the driver training course.

In this course he (she) has done behind-the-wheel driving for __________ school periods and as a passenger has observed the driving of other students for ______ periods. He (she) now has the knowledge and skills that are basic to handling a motor vehicle. However, he (she) is still in need of practice in driving before he (she) will be an efficient driver. This practice can best be provided by you. And in providing the practice, you should have him (her) drive your car under your supervision. This supervision should include giving special attention to each of the following phases of driving that are checked below:

- ☐ Practice steering in a straight line
- ☐ Hand-over-hand steering
- ☐ Shifting gears
- ☐ Backing the car
- ☐ Right and left turns
- ☐ Turning car around in width of street (turnabouts)
- ☐ Parallel parking
- ☐ Angle parking
- ☐ Starting on an upgrade
- ☐ Parking, upgrade and downgrade
- ☐ Overtaking and passing on highway
- ☐ Heavy traffic driving
- ☐ Driving at night
- ☐ Driving under unfavorable conditions

Obviously, in the limited practice driving your son (daughter) has done, he (she) has not had the variety of opportunities he (she) needs to be capable of using good judgment in all traffic conditions. You can be of great help to him (her) in his (her) learning to make such judgments if, while riding with your son (daughter), you will point out traffic situations that may lead to trouble unless proper defensive driving techniques are used.

We will appreciate your help in making your son (daughter) a safe and efficient driver.

Very truly yours,

____
Principal

____
Teacher

Monthly Record of Gasoline Purchases for Driver Training

District vehicle number ____________________ Credit card number ____________________

License number ____________________ Signature ____________________

Date of purchase	Odometer reading	Number of gallons	Cost	Invoice number

Thank-you Letter to Automobile Dealer

Dear ______________________________:

We appreciate your lending us a car (cars) for use in our behind-the-wheel driving program. By doing so, your company has played an important role in the success of this vital educational endeavor. The ultimate goal of driver training, of course, is to make our community a safer one in which to live.

During the school year, we have followed your recommendations in caring for the car (cars). I trust its (their) present condition meets with your full approval.

Very truly yours,

____
Principal

Certification Letter for Driver Education Students

Supervisor of Driver Education
Registry of Motor Vehicles
100 Nashua Street
Boston, Massachusetts 02114

Dear Sir:

I recommend the students named in this letter for driver education certificates. I certify that these students have satisfactorily completed thirty (30) clock hours of classroom instruction, six (6) clock hours of practice driving, and six (6) hours as observers in a driver training car, in accordance with the standards established by the Registrar of Motor Vehicles.

Name	*Address*	*Date of Birth*	*Date Course Completed*
John Doe	26 Main St., Everett	2/21/51	Nov. 1, 1969
John Smith	2 Ocean Ave., Revere	1/9/52	Nov. 1, 1969
Mary Doe	29 Green St., Malden	4/30/53	Nov. 1, 1969

(All entries on this page must be double spaced.)

Very truly yours,

____
Principal

____
Instructor

(Check or money order for $1.50 per name must be included.
Make checks payable to Registry of Motor Vehicles.)

Certification Letter for Driver Education Classroom Students - Limited-Participation

TO WHOM IT MAY CONCERN:

The records of ______________________________ School
school name

show that ______________________________ has satisfactorily
name of student

completed thirty (30) clock hours of classroom instruction in driver education.

The starting date of the course ______________________________

Name of instructor ______________________________

Very truly yours,

____
Principal

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*Aetna Life & Casualty Driver Education Services, 151 Farmington Avenue, Hartford, Connecticut 06115

*Allstate Insurance Company, Allstate Plaza, Northbrook, Illinois 60062

*American Automobile Association, 1712 G. Street N. W., Washington, D.C. 20006

*American Honda Motor Co., Inc., 100 W. Alondra Boulevard, Gardena, California 90247

American Manufacturers Association, 320 New Center Bldg., Detroit, Michigan 48202

American Mutual Insurance Alliance, 20 N. Wacker Driver, Chicago, Illinois 60606

*American Oil Company, 910 S. Michigan Avenue, Chicago, Illinois 60605

American Optometric Company, 4030 Chateau Avenue, St. Louis, Missouri 63100

American Technical Society, 850 E. 58th Street, Chicago, Illinois 60637

*American Telephone & Telegraph Co., Information Department, Film-Radio-Display Division, 195 Broadway, New York, New York 10020

*Associated Films, Inc., 490 King Street, Littleton, Massachusetts 01460

Association for the Aid to Crippled Children, 345 E. 46th Street, New York, New York 10017

Automobile Manufacturers Association, Detroit, Michigan

Chas. A. Bennett Co., Inc., 809 W. Detweiller Drive, Peoria, Illinois 61614

*Champion Spark Plug Co., Film Department, 900 Upton Avenue, Box 900, Toledo, Ohio 43601

*Charles Cahill & Associates, Box 3200, Hollywood, California 90028

Chrysler Corporation, 341 Massachusetts Avenue, Detroit, Michigan 48231

*Consulate General of Canada, 500 Boylston Street, Boston, Massachusetts 02116

*Coronet Films, Coronet Bldg., 65 E. Water Street, Chicago, Illinois 60601

*Creative Arts Studio, 814 H. Street NW, Washington, D. C. 20001

Thomas Y. Crowell Company, 201 Park Avenue S., New York, New York 10003

*Datafilms, Inc., 2625 Temple Street, Los Angeles, California 90026

*Walt Disney Productions, 237 Northwest Highway, Park Ridge, Illinois 60068

*Doubleday & Company, Inc., 227 Park Avenue, New York, New York 10017

Dudley Pictures Corporation, 666 N. Robertson Boulevard, West Hollywood, California 90069

*Films available

*Employers Insurance Co. of Wausau, Wausau, Wisconsin 54401

*Encyclopaedia Britannica Educational Corp., 425 N. Michigan Avenue, Chicago, Illinois 60611

Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut 06880

*Fass-Levy Films, 1200 Vine Street, Denver, Colorado 80206

*Firestone Tire & Rubber Corporation, Akron, Ohio 44317

*Ford Motor Company, Film Library, The American Road, Dearborn, Michigan 48121

*General Aniline & Film Corp., 140 W. 51st Street, New York, New York 10020

*General Motors Corporation Film Library, General Motors Building, Detroit, Michigan 48202

*B.F. Goodrich Co., Akron, Ohio 44318

*Goodyear Tire & Rubber Co., Akron, Ohio 44309

*Harold L. Smith, 3757 Wilshire Boulevard, Los Angeles, California

The Hertz Corporation, 209 N. Michigan Avenue, Chicago, Illinois 60601

*Highway Safety Fundation, P. O. Box 1563, Mansfield, Ohio 44901

Highway Users Federation for Safety and Mobility, 200 Ring Building, 1200 18th St., N.W., Washington, D. C. 20036

Illinois Insurance Information Service, 141 W. Jackson Boulevard, Chicago, Illinois 60604

Institute of Driver Behavior, 1380 Penobscott Building, Detroit, Michigan 48226

Institute of Traffic Engineers, 2029 K. Street NW, Washington, D. C. 20026

*Insurance Information Institute, 110 William Street, New York, New York 10038

Insurance Institute for Highway Safety, Watergate Six Hundred, 600 New Hampshire Avenue, NW, Washington, D. C. 20037

*The Jam Handy Organization, 2821 E. Grand Boulevard, Detroit, Michigan 48226

Kentucky Department of Public Safety, Commonwealth of Kentucky, Frankfurt, Kentucky 40601

Lear Kiegler Service, Inc., 6700 Allentown Boulevard, Harrisburg, Pennsylvania 17112

Legal Publications, 145 Liston Street, Lewiston, Maine 04240

*Liberty Mutual Insurance Company, 175 Berkely Street, Boston, Massachusetts 02117

*Long Filmslide Service, 7505 Fairmont Avenue, El Cerrito, California 94530

*Louisiana Department of Highways, P. O. Box 4245, Baton Rouge, Louisiana 70804

*Lumberman's Mutual Casualty Co., Public Relations Department, 20 N. Wacker Drive, Chicago, Illinois 60606

The Macmillan Company, 866 Third Avenue, New York, New York 10022

*Marathan Oil Co., Film Library, 539 S. Main Street, Findlay, Ohio 45840

*Massachusetts Department of Education, 182 Tremont Street, Boston, Massachusetts 02111

Massachusetts Registry of Motor Vehicles, 100 Nashua Street, Boston, Massachusetts 02114

*Massachusetts Safety Council, Inc., 20 Beacon Street, Boston, Massachusetts 02108

*McGraw-Hill Book Company, 330 W. 42nd Street, New York, New York 10036

Michigan State Police, Public Information Office, East Lansing, Michigan 48834

*Minnesota Mining and Manufacturing Co., 2501 Hudson Road, St. Paul, Minnesota 55119

*Modern Talking Picture Service, Inc., Department VW, 1212 Avenue of the Americas, New York, New York 10036

Motorcycle, Scooter, and Allied Trades Association, Box 231, Worthington, Ohio 43085

Motor Vehicle Department, State of Wisconsin, State Office Building, Madison, Wisconsin 53702

*National Association of Automotive Mutual Insurance Companies, 20 N. Wacker Drive, Chicago, Illinois 60606

*National Audio Visual Center (GSA), Washington, D.C. 20409

National Committee on Uniform Traffic Laws and Ordinances, 525 School Street, SW, Washington, D. C. 20024

*National Dairy Products Co., Safety Divison, 160 Madison Avenue, New York, New York 10016

*National Education Association Commission on Safety Education, 1201 6th St., NW, Washington D. C. 20036

National Highway Safety Bureau, Riddell Building, 1730 K. Street NW, Washington, D. C. 20006

*National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611

*National Women's Christian Temperance Union, 1730 Chicago Avenue, Evanston, Illinois 60201

Nationwide Insurance Companies, 246 N. High Street, Columbus, Ohio 43216

New York University Press, 32 Washington Place, New York, New York 10003

*Northwestern University Traffic Institute, 1804 Himan Avenue, Evanston, Illinois 60201

*Ontario Department of Transportation, Parliament Building, Queens Park, Toronto, Ontario Canada

*Pennsylvania State University, Audio-Visual Service, University Park, Pennsylvania 47401

Popular Science Publishing Co., Inc., 355 Lexington Avenue, New York, New York 10017

Porto-Clinic Instruments, Inc., 298 Broadway, New York, New York 10007

*Progressive Pictures, 1810 Francisca Court, Benicia, California 94510

Readers' Digest Association, Pleasantville, New York 10570

*Safety Research and Education Project, Teachers' College, Columbia University, New York, New York 10025

Seiberling Tire and Rubber Company, Akron, Ohio 44309

*Shell Oil Company, 50 W 50th Street, New York, New York 10020

*Sid Davis Productions, 2429 Ocean Park Boulevard, Santa Monica, California 90405

*Society for Visual Education, Inc., 1345 Diversey Parkway, Chicago, Illinois 60614

Stanbow Productions, Inc., 12 Cleveland Street, Valhalla, New York 10595

*Sterling Movies, Inc., 42 W. 61st Street, New York, New York 10023

Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402

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Charles C. Thomas, Publisher, 301-27 E. Lawrence Avenue, Springfield, Illinois 62703

*Travelers Insurance Co., A. V. Center, 52 Prospect Street, Hartford, Connecticut 06115

*Union Pacific Railroad, Motion Picture Bureau, 1416 Dodge Street, Omaha, Nebraska 68102

Universal Underwriters Insurance Co., 5115 Oak Street, Kansas City, Missouri 64112

*University of Indiana, Audio-Visual Center, 1840 East 10th Street, Bloomington, Indiana 47401

Vanguard Press, Inc., 424 Madison Avenue, New York, New York 10017

Western Insurance Information Service, 3325 Wilshire Boulevard, Los Angeles, California 90005

Western Publishing Education Services, 1220 Mound Avenue, Racine, Wisconsin 53404

Wilding, Inc., 1345 Argyle Street, Chicago, Illinois 60640

Yamaha International Corporation, Box 5450, Los Angeles, California 90054

*Zurich Insurance Company, 111 W. Jackson Boulevard, Chicago, Illinois 60605

MASSACHUSETTS DEPARTMENT OF EDUCATION

Driver and Traffic Safety Education Curriculum Guide
Evaluation Sheet

General Comments

Suggestions for Additions or Deletions

Specific Comments (Please include page references where applicable.)

Return to:

Supervisor of Driver Education

Department of Education

182 Tremont Street

Boston, Massachusetts 02111

Name ______________________________

Title ______________________________

School ______________________________